October 1, 1963

Time at entrance to Pearl Harbor = 1105

Time at sunset = 1820. Position at sunset = 20.40 159.10

Miles traveled from entrance to Pearl Harbor to sunset = 70

Miles traveled from sunset to 2400 hours = 54

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	1200	Visual	158.02	21.09
2.	1435	Loran	158.25	20.58
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

October 2, 1963

Time at sunrise = 0633 Position at sunrise = 20.02 160.44

Time at sunset = 1836 Position at sunset = 19.20 162.42

Miles traveled from 0000 hours to sunrise = 57

Miles traveled from sunrise to sunset = 107

Miles traveled from sunset to 2400 hours = 51

	TIME OF FIX	TYPE OF FIX	DONGITUDE	LATITUDE
L.	0600	STARS	160.53	20.04
2.	1200	Loran.	161.42	19.41
3.	1500	Loran	162.11	19.29
4.	1910	STARS	162.42	19.19
5.				
6.				
7.				
8.	Incl 3			

October 3, 1963

Time at sunrise = 0647 Position at sunrise = 18.40 164.14

Time at sunset = 1853 Position at sunset = 18.05 165.45

Miles traveled from 0000 hours to sunrise = 46

Miles traveled from sunrise to sunset = 90

Miles traveled from sunset to 2400 hours = 45

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0610	STARS	164.12	18.37
2.	0800	Loran	164.19	18.34
3.	1200	Loran	164.55	18.21
4.	1920	STARS	165.50	18.06
5.				
6.				

October 4, 1963

Time at sunrise = 0701 Position at sunrise = 17.20 167.35

Time at sunset = 1904 Position at sunset = 16.48 169.16

Miles traveled from 0000 hours to sunrise = 64

Miles traveled from sunrise to sunset = 104

Miles traveled from sunset to 2400 hours = 52

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0630	STARS	167.31	17.21.5
2.	1053	Sun Line	168.07	17.11
3.	1615	Loran	169.04.5	16.54
4.	1940	Visual (Johnston Isl.) ↑	169.12	16.45
5.	2015	Visual ↓	169.22	16.42
6.				

October 5, 1963

Time at sunrise = 0706 Position at sunrise = 15.08 168.59

Time at sunset = 1906 Position at sunset = 13.45 169.27

Time and miles from Johnston Island at nearest point = 05, October 1963 2015 = 7.8

Miles traveled from 0000 to sunrise = 61

Miles traveled from surnise to sunset = 105 OK

Miles traveled from sunset to 2400 = 49

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0640	STARS	169.03	15.12.5
2.	1115	Loran	168.52	14.45
3.	1620	Loran	169.21	14.05
4.	1935	STARS	169.36	13.41
5.				
6.				

October 6, 1963

Time at sunrise = 0714 Position at sunrise = 12.16 171.09

Time at sunset = 1913 Position at sunset = 13.14 171.16

Miles traveled from 0000 to sunrise = 80

Miles traveled from sunrise to sunset = ~~110~~ 97

Miles traveled from sunset to 2400 = 49

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	0645	STARS	171,05	12,18
2.				
3.				
4.				
5.				
6.				

Time at first leg of the actual grid = 1330 05, Oct. 1963

Miles between (0000/sunrise) to first leg of grid = 42

Miles between first leg of grid and (sunset/2400) = 63

October 7, 1963

Time at sunrise 0708 Position at sunrise = 14.28 169.58

Time at sunset 1905 Position at sunset = 15.23 170.16

Miles traveled from 0000 to sunrise = 62

Miles traveled from sunrise to sunset = 126

Miles traveled from sunset to 2400 = 60

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
L. 0635	STARS	170.17.5	14.40.5
2. 1545	Loran	169.51	15.32
3.			
4.			
5.			
6.			

October 8, 1963

Time at sunrise = 0715 Position at sunrise = 14.02 171.47

Time at sunset = 1907 Position at sunset = 14.12 172.46

Miles traveled from 0000 to sunrise = 62

Miles traveled from sunrise to sunset = 140 131

Miles traveled from sunset to 2400 = 30

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1. 0635	STARS	171.51	14.00
2. 1000	Loran	172.07	13.40
3. 1125	Loran	172.19	13.29
4. 1500	Loran	172.43	13.36
5. 1947	STARS	172.49	14.16
6.			

October 9, 1963

Time at sunrise = 0717 Position at sunrise = 15.05 171.48

Time at sunset = 1907 Position at sunset = 16.10 170.41

Miles traveled from 0000 to sunrise = 48

Miles traveled from sunrise to sunset = 90

Miles traveled from sunset to 2400 = 45

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1. 0650	STARS	171.57	15.08
2. 1200	Loran	171.30	15.32
3. 1500	Loran	171.10	15.37
4. 2000	STARS	170.36	16.15
5.			
6.			

October 10, 1963

Time at sunrise = 0719. Position at sunrise = ~~16.45 172~~

Time at sunset = 1923 Position at sunset = 14.40 174.03

Miles traveled from 0000 to sunrise = 104

Miles traveled from sunrise to sunset = 133

Miles traveled from sunset to 2400 = 48

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1. 0650	STARS	172.21	15.46
2. 1000	Loran	172.41	15.32
3. 1130	Loran	172.55	15.19
4. 1600	Loran	173.32	14.45
5.			
6.			

October 11, 1963

Time at sunrise = 0724 Position at sunrise = 16.00 173.18

Time at sunset = 1909 Position at sunset = 16.52 171.28

Miles traveled from 0000 to sunrise = 58

Miles traveled from sunrise to sunset = 121

Miles traveled from sunset to 2400 = 37

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	1005	Loran	172.48	16.30
2.	1130	Loran	172.39	16,39
3.	1410	Loran	172.17	16.56
4.	1515	Loran	172.05	16.55
5.				
6.				

ends 0/grid at 2100

October 12, 1963

Time at sunrise = 0700 Position at sunrise = 16.50 169.58

Time at sunset = 1858 Position at sunset = 17.08 168.47

Miles traveled from 0000 to sunrise = 52

Miles traveled from sunrise to sunset = 73

Miles traveledfromsunset to 2400 = 51

	TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.	1200	Visual	169.35.5	16.47.2
2.	1400	Visual	169.21	16.53
3.	1700	Loran	169.03	17.03
4.				
5.				
6.				

1000 17th
ends grid

October 13, 1963

Time at sunrise = 0659 Position at sunrise = 17.51 167.54

Time at sunset = 1843 Position at sunset = 18.29 166.01

Time of arrival at last point of actual grid = 11, October 1963 (2100)

Miles traveled between 0000 and sunrise = 27

Miles traveled between sunrise and sunset = 107

Miles traveled between sunset and 2400 = 49

Miles between ([redacted]/sunrise) and last point of grid = 131

Miles between last point of grid and ([redacted]/2400) = 25

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1. 0700	STARS	167.49.5	17.54
2. 1215	Loran	166.58	18.12
3. 1910	STARS	166.09	18.35.5
4.			
5.			
6.			

October 14, 1963

Time at sunrise = 0651 Position at sunrise = 19.09 164.27

Time at sunset = 1833 Position at sunset = 19.43 162.21

Miles between 0000 and sunrise = 59

Miles between sunrise and sunset = 113

Miles between sunset and 2400 = 44

Time and miles from Johnston Island at nearest point =

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1. 0620	STARS	164.31	19.04.5
2. 1200	Loran	163.33	19.19
3. 1900	STARS	162.39	19.40
4.			
5.			
6.			

October 15, 1963

Time at sunrise = 0638 Position at sunrise = 20.07 161.00

Time at sunset = 1814 Position at sunset = 20.30 159.23.5

Miles traveled between 0000 and sunrise = 56

Miles traveled between sunrise and sunset = 92

Miles traveled between sunset and 2400 49

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1. 0600	STARS	161.04	20.09.2
2. 1015	Loran	160.19	20.16.5
3. 1200	Loran	160.04	20.20.5
4. 1345	Loran	159.49	20.29
5. 1500	Loran	159.36	20.31
6. 1915	Loran	159.04	20.42

October 16, 1963

Time at sunrise = Position at sunrise =

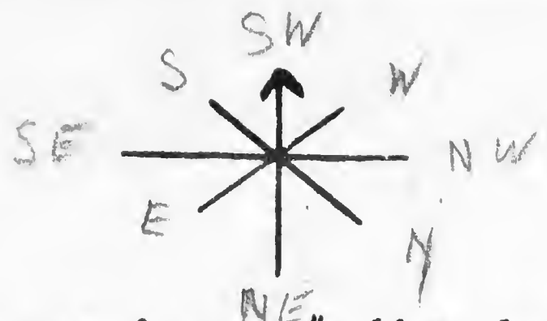
Time at sunset = Position at sunset =

Miles traveled between 0000 and sunrise =

Miles traveled between sunrise and sunset =

Miles traveled between sunset and 2400 =

TIME OF FIX	TYPE OF FIX	LONGITUDE	LATITUDE
1.			
2.			
3.			
4.			
5.			
6.			

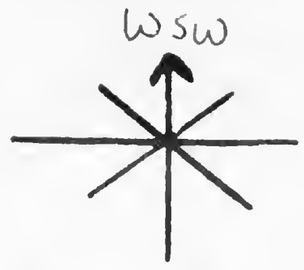


DATE 1 ~~Nov~~. Oct.
Pg.# 1

time	species	#	dir.	hgt.	remarks	loc.
1045					entrance to Pearl Harbor	
1101	Noddy tern	1	↘	15-25'	300 yds starboard	
1103	Frigate bird	1	↻			
1104	" "	1	"			
1104	" "	1	"			
1107	Noddy tern?	1	→			
1109	Frigate bird	2	○			
1110	Tern ?	1	⇐			
1112	Noddy tern	1	←			
1112	" "	1	→			
1123	" "	1	→			
1116	Frigate	1	←			
1128	Bulwer?	2	→			
1129	Shearwater	1	→			
1130	Noody tern	2	→			
1133	Jaeger	1	⇀			
1146	Pomerain Jaeger	1	—		Probably Pomerain — salmon water same build as above? 50 yds off bow	
1146	Frigate bird	1	←			
1151	Wedge tail	1	↓			
1152	Frigate bird	1	←			
1205	wedge tail	3	←	low	all singles	
	frigate bird	1	↑		perhaps same bird - 1000 yds. ~~to~~ for imm. ~~to~~ stationary high in air	
	Noddy tern	2	↓	low	500 yds ↑	
1207	wedge tail	1	→			
	wedge tail	1	→		50 yds off starboard bow.	
1210	wedge tail	2	↓	single		
	Pom. jaeger	1	↯↓		~~45~~ ± yds. off port	
1215	new Zealands?	1	←		fast gliding flight (seemed to have M pattern)	
1220	wedge tail	1	←	low	1000 yds ±	
1224	wedge tail	1	←	"	100 yds off bow	
1225	bird sp.	1	←	—	- near Jaeger	
1235	Jaeger	1	NE	15-20		
1240	wedge tail ?	1	←		4-500 yds	
1258	dark wedgetail?	1	←		looked like wedgetail above, wing linings lighter than back	
	small shearwater	1	←		dark above, light below.	
	small shearwater	1	←		" " 1000 yds.	

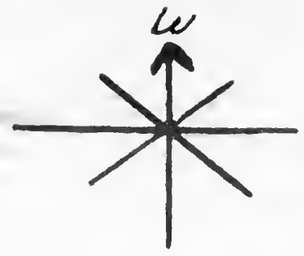
DATE 10/1
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
13:01	wedge tail	1	↘	20-25'	50 yds off bow.	
13:13	w.t.t. bird	2	↓	on H_2O	100 yds off starboard	
13:42	noddy tern	1	→	on H_2O	500 yds off starboard - constant wingbeat	
13:50	white bird ?	1	→	50	1000 yds.	
14:28	wedge tail	2	→		200 yds off stern	
14:39	wedge tail	1	→	clear	50-100 yds.	
15:03	wedge tail	1	↘	on H_2O	100 yds off starboard	
15:27	Bonin Island Petrel	1	←	on H_2O	50 yds off bow	
1551	wedge tail	1	↘	—	—	
1610	Dark-Rumped Petrel	1	↙	on H_2O	white underneath including undertail. Under trailing edge of wing white - no visible white upper neck-white forehead. 50-100 yds off port.	
1621	FLOCK	75+			⎫ actively feeding - no flying fish observed - ⎪ saw 2 wedge-tails squabbling in water ⎭	
	wedgetails	70+				
	Bonin Is.	1				
	Sooty Shearwater	1				
	Large Petrel	1				
1626	White tailed Tropicbird	2	↓	150ft	passed boat astern	
1629	Dark-rumped petrel?	1	↙	20ft	300 yds on port	
1645	Dark-rumped petrel?	1	→	20 ft	passed from port to starboard 300-500 yds abow	
1645	White-tailed Tropicbird	1	↓	250ft	500 yds to starboard	
1655	Bird sp.	1	→	W.O.	Shaped like a frigate bird about the size of a wedgetail. All black with tern-like flight. Could suggest a dark-phase Jaeger.	
1702	Dark-rumped Petrel?	1	↙	—	no white neck; grey back, white underparts, etc.	
1702	Pomarine Jaeger.	1	↙	30'	- circled close to ship - was following Pterodroma Petrel!	
1710	Pink-footed Shearwater?	1	→		more slender wings (wings look longer) wedge tail single white underparts, underwing same pattern) more normal shearwater flight. lighter flight more flapping etc —	



DATE 1 Oct 60
Pg.# 3

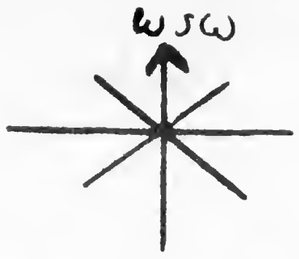
	time	species	#	dir.	hgt.	remarks	loc.
1 Sighting	17:15	Booby sp. Imm.	1	↘	20ft	these two birds were staying together - the booby following the petrel.	
		Petrel sp	1			White underparts - more brownish than grey above - 500yds sighted on port, passed astern to starboard chased one another.	
	17:34	Petrel sp	1	←	10-50ft	200-400 yds off bow soaring high	
	17:43	Noddy Tern	2	←	25ft	300 yds off port bow.	
SSW	1752	Wedge-tail	1	↓		300 yds off	
	1756	Noddy Tern	2	←	on H_2O	200 yds off bow	
	1808	Shearwater sp.	1	↙	on H_2O	400 yds off port	
	1820	Japanese White eye	5	→		2 landed on ship & were well observed	
	1830	wedge tail	1	←	low	across bow - 100 yds.	
	1836	tropic bird sp	1	↓	100'+	800-1000 yds - light bod.	



DATE Oct. 2
Pg.# 1

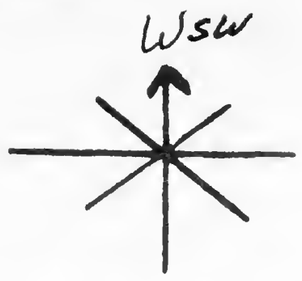
start 05:30

time	species	#	dir.	hgt.	remarks	loc.
0606	shearwater or petrel	2	↓	low	not light enough for identif.	
0617	booby?	1	↓	-	sitting on water. then flew - white head & neck. Ventral surface body & wings white except for brown wing across chest. Dorsal surface mottled brown. Slightly longer than wedge tail. Grey-white dorsal wing bars meeting across back.	
0638	wedge tail	1	←	low	100 yds off port.	
0647	wedge tail	1	←	low	ave. hundred yds off bow.	
0656	d. mmg ?	1	→		4-500 yds - very fast	
0659	White-tail + ropinsird	4			flying as 2 pairs	
0700	wedge tail	1	↗			
0720	boobie petrel?	1	↓		far out	
0721	" "	1	↓		"	
0730	wedge tail	1	↑		150 yds off	
0734	shearwater	1	↓		1500 yds +	
	wedge tail	1	↓		passed 100 yds - appeared lighter on head.	
0744	sooty tern	2			all dark prob. dmm. sooty terns. cor	
	Noddy ?.	5±	←			
flock	wedge tail	15±			at least 1 dark phase wedge-tail.	
	boobie is type	2±			very light below; slash on wing; could see white on head.	
0748	" masked? booby	1	↓	50'	75 yds off port - red bill; pure white below, dark above incl. all of wings & tail?.	
	wedge tail	1	↓	low	1000 yds ±	
0850	whale	1	—	—		
0850	Bonito.??	1	↘		more pointed snout, prominent dorsal fin: - blowing @ 100 yds.	
0851	Bonito. Petrels!	2	→ ←	—	—	
0903	wedge-tail	1	↑	low	200 yds ±	
0907	Bonito. ?.	1	↓		close in	
0809	wedge-tail ?	2	↓		1000 yds + 1 in to 100 yds.	
0810	wedge-tail	1	↘		"	
0814	wedge-tail	1	←		1000 yds +	
0821	shearwater	1	←		"	
0831	wedge-tail	1	←			

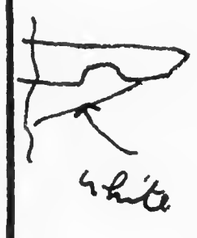


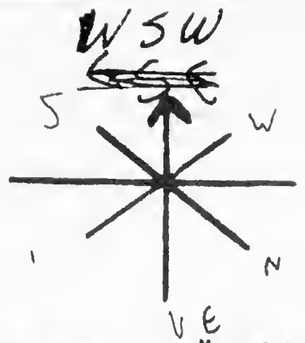
DATE 2 Oct
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
0904	W-T tropicbird	4	ⓒ		} all five birds together	
0904	R-T "	1				
0906	Bonin Petrel	3			in rain squall	
0910	Flock				} all in rain squall (1) wedgetail dark phase	
	wedgetail	50+				
	Bonin Pet.	10+				
	white-necked Petrel	1				
	Sooty tern	2				
0918	tropicbird	1				
0920	wedge tail	1				
0929	Bonin Petrel	5			flock	
0937	W-T tropicbird	3	↓			
0943	Flock					
	W-T Tropic bird	4	ⓒ			
	R-T-tropic bird	3	ⓑ			
0954	wedge tail	1	←			
0955	" "	1	←		dark phase	
0957	" "	2	←			
~~1000~~	~~" "~~ ~~Bonin Petrel~~	~~2~~			~~flock~~	
1000	Flock				flying fish under flock - saw several sheanwaters with flying fish in bills saw one Sheanwater drop down & grab at something in middle of small pool of blood - This was near edge of rain squall (1 immm booby, brooded bonin mantle, red scaly white mark obelisks on outside edges of tail)	
	Wedge tail	60+	ⓒ			
	Bonin Petrel	3+	ⓒ			
	Imm. Booby	3	ⓒ			
	Sooty tern	2	←			
1015	Flock white-tail Tropicbirds	9				
1040	Flock white-tailed tropicbird	5	ONE	150-200 yds		
1050	wedge-tail	1	↓			
1105	Sheanwater	1			black cap, brown back, ca wedge-tail size or slightly smaller — black; dark wing, white	



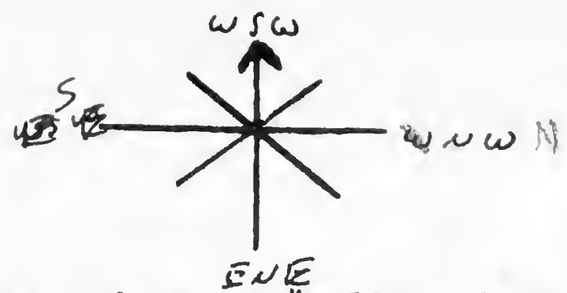
DATE 2 Oct
Pg.# 3

time	species	#	dir.	hgt.	remarks	loc.
1116	w-t tropicbird	1			150'	
1124	Bonin Petrel	1				
1125	w-t tropicbird	1				
1142	wedge tail	1	↓			
1148	" "	1	→			
1155	" "	7			small flock w of feeding	
1200	~~Petrel~~ Petrel ?	1			~~Pale~~ dirty grayish below, somewhat darker ~~brownish~~ brownish gray above white on head very distinct	
12:07	Bonin Is Petrel	1	←		size of Wood's tern, flight half way between Tern & Petrel type.	
12:08	Wedge-tail	1	→		400 yds off bow	
1209	Bonin Is Petrel	1	→		100 yds off starboard	
1213	Petrel sp	1	⇆		500 yds off bow	
1219	Bonin Is Petrel	1	→		300 yds off starboard	
1244	wedge tail	1	→		200 yds starboard	
1250					ship stopped - plankton sample	
1307	wedge tail	1	NE		300 yds off port.	
1314	" "	2	↓		200 yds off starboard	
1324	" "	2	↓			
1325	Masked Sh.	1	↓		POSITIVE - dark above, light below extending up on sides near tail. smaller, much blacker, diff. wing bars, shorter wings, coal white contrasting underwings.	
1332	frigate bird	1	←		Dim. 1000+ yds off bow; lone bird. sailed around for 10± min.	
1338	shearwater	1	↓		1000 yds +	
1430	Red-t.t bird	2	↓		later ship; 2nd distinct approach	
1450	wedgetail	3	⇒		100 yds across bow	
	shearwater white	1	⇓		1000 yds. off starboard	
1505	small passerines	20+	←	100'	during squall. at least 5 min. before seen; angle then flocked 20+ such calling; did not appear exhausted. 2 think white-eye others think possibly house finches.	
1516	Wedge tails	2	↙			
1528	" "	1	S	=	=	
1540	PASSERINGS	40	ESE	100'	over ship - calling — light brown?	
1600	Wedge tail	1	↓	-	—	
1607	FLOCK					
large bird	sooty Terns Petrels wedgetails	2 11	↓	-	1500 yds.	



DATE 10/2
Pg.# 4

	time	species	#	dir.	hgt.	remarks	loc.
WSW ↑	1630	W.T. Tropic	1	↘	2-300ft.		
	1702	Large petrel sp	2	→	on H_2O	white underside including undertail coverts. considerable gray on back - not moving as fast as Bonin Is Petrels perhaps White-necked Petrels.	
	1711	Wedgetail	1	←	on H_2O		
	1716	Wedgetail	1	→	on H_2O	400 yds on starboard	
	1720	Passerine Sp	1	↙	50ft	over ship	
	1738	Wedge Tail	3	→	30 ft.		
	1747	R. J. Booby (3)	1	↑		1000 yds.	
	1820	white-eye	1	↻			
	1828	Bonin Petrel	1	→		Wave shot + missed! close too.	
						observation stopped 1910	



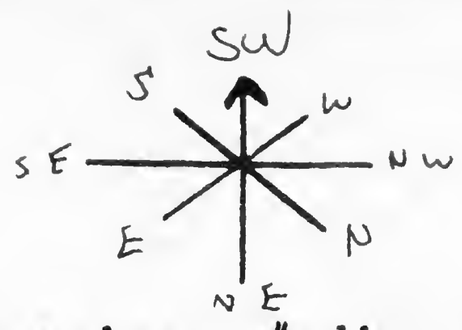
DATE 30 Oct
Pg.# 1

observation began 0601

time	species	#	dir.	hgt.	remarks	loc.
0610	Sooty tern	1				
0650	Bulwers Pet	1	E←			
0657	wedge-tail	2	E←			
0704	R.T. Tropic	2	©	50-75FT.		
0720	white-wk Petrel	1	e			
0720	Shear-Pet	1	e			
0728	Pterodroma	1	→WNW			
0730	Bonin Petrel	1	WNW			
0740	Pterodroma	1	WNW			
0755	"	1	WNW			
0756	wedge tail	1	WNW			
0757	Sooty Shearwater	1	ESE			
0800	Pterodroma	2	ESE			
0806	"	2	WNW			
0807	"	2	WSW		1500 yds	
	Bonin Petrel	1	WSW			
	R.T. Tropic	1	WSW		sitting on water	
0810	Pterodroma	2	WNW			
0812 flock	Shear + Pet	25±			2½ miles out did not appear to be actively feeding - flock fairly widely dispersed	
	Boobys (Masked + Red-Tail)	2				
0817	Bonin & Pet.	1	WSW		50 yds off bow.	
0824	Pterodroma	1	WNW			
0825	"	3	ESE			
0826	wedge tail	1	WNW			
0832	Bonin Petrel	1	WNW			
0832	Pterodroma	1	WNW			
0838	"	1	WSW			
0838	"	1	WSW			
0843	Bonin Petrel	1	ESE			
0850	Pterodroma	1				
0910	Pterodroma	2	←			
0914	Shearwater or Petrel	1	→		too far to see clearly	
0925	Petrel	1				
	Wedge-tail	2	→		500+ yds	
0926	petrel or shearwater	1	→		1000 yds	

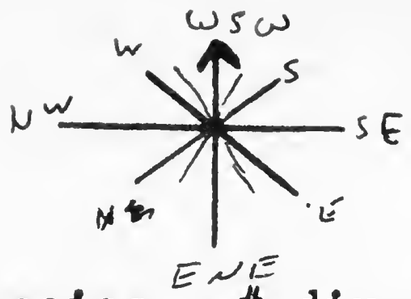
DATE 30 Oct 63
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
0930	Shearwaters or Petrel	3	←		1 mile or more off bow	
0940	White-necked Petrel	1	→		300-500 yds White neck visible	
0950	FLOCK	20±				
	Terns	10				
	Shearwaters	8				
	*?	2	↓			
	like a many only larger				definite black & white - considerable white on upper surfaces including possibly tail - flew like shearwater but was booby sized. Joined flock from starboard. Flock was ½ to 1 mile off port bow & moving rapidly to port.	
0958	Wedgetail	1	→		500 yds	
1002	Bird sp	1	→			
1007	Shearwater or Petrel	4	←		1000 yds+ off bow	
1012	Shearwater or Petrel	2	→		1000 yds+ off bow	
1015	Bonin Is Petrel	1	→		300 yds to Starboard bow	
1020	Shearwater or Petrel	1	→		1½ mi + off Starboard bow	
1022	Small Flock	6+	→			
	Booby?	1				
	Wedgetails	3				
	Smaller Petrels & Shearwaters	3+				
1023	School of dolphins		FISH-TYPE		at least one very large and several smaller dolphins broke water 300 yds or less ~~on~~ Starboard	
1025	Bonin Is. Petrel	2	→		50 yds across bow	
1030	Bulwer's Petrel	1	←		100 yds off port	
1032	Bonin Is Petrel	1	→		300 yds off starboard	
1038	Bonin Is Petrel	1	→		75 yds off bow	
1043	Bonin I. Petrel	1	←		200 yds off bow	
1047	Petrel	~~1~~	→		500 yds off bow	
1051	Bonin Is Petrel	~~1~~	←		50 yds off starboard - came straight towards ship until 50 yds then looped around bow of ship. Grey band around lower neck like indistinct necklace seen on last 4 Bonin Is. Petrels. WK & RF	



DATE Oct 3
Pg.# 3

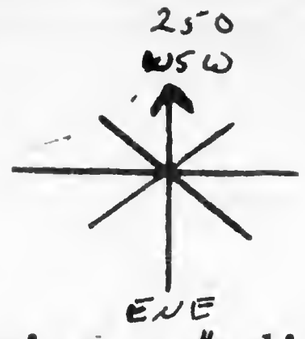
time	species	#	dir.	hgt.	remarks	loc.
1102	New Zealand/ Shearwater		←	--	About size of wedgetail - all white under parts except for black wingtips. Dorsal surface grey-brown with darker diagonal bands on wing, meeting on back.	
1103	Bonin Pet.	1	→	-		
1130	Shearwater/ Petrel	2	→		1500 yds + off bow	
1136	Christmas Is Shearwater?	1	←		dark shearwater type not seen well	
1235	Bulwer Petrel	1	ESE ←			
1238	Bonin Pet.	1	SE ←		low; off starboard.	
1245					ship stopped for plankton sample.	
1322	New Zealand Shearwater?	1	↖		800 yds + off bow. Had gray pattern? - flight not like a petrel - seems ± flaps then glide. too far out to be sure.	
1330					ship underway.	
1408	wedgetail ?	1	N		800 yds + off starboard.	
1416	New Zealand Sh.?	1	NW		150 yds off bow - longer wings than petrel - very gray above. rapid beats then sail.	
1435	still zig zagging.				why?	
1450	Bonin Petrel	1	?		500 yds ±	
1509	Shearwater				large (wedgetail sized?) ±	
1530	wedge tail	2				
1530					still making circles	
1604	Shearwater	1			very white underneath, very light dusky gray above, no dark marking at all on dorsal surface very rapid wing beats, ca wedge-tail size ±	
	Tropicbird	1				
1607	wedge tail	2	→ NNE			
1630	Bonin Petrel	2	SSE			
1651	Wedge tail	1	NNW			
1700	Ptenochroma	1				
1706	Wedge tail	1	NNW			
1709	Ptenochroma	1				
1717	Dark-rump Petrel	1				
1742	Dark-rump Petrel	2	SSE			
1742	tropic bird	1	SW			
1742	Sooty Tern	1	NW			



DATE 3 Oct
Pg.# 4

time	species	#	dir.	hgt.	remarks	loc.
1745	wedge tail	1	NNE			
1752	Pterodroma	1	ENE			
1802	Sterna	1	WSW			
1823	BIRD	1	SE	-	-	
1842	Sterna	2	SE			
1901	Shearwater	1				

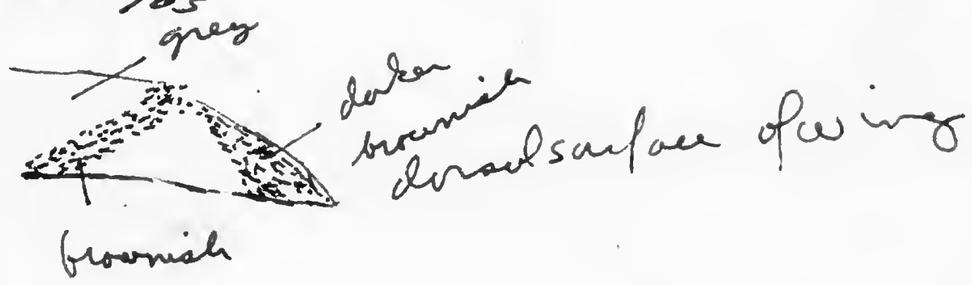
Observations ended 1920

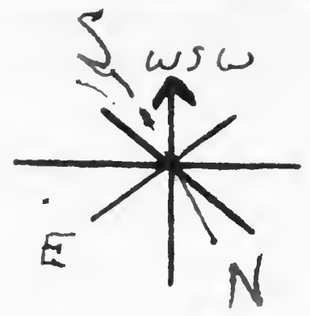


DATE 4-Oct. '63
Pg.# 1

start 0650 - late start
watch reported birds earlier in morning.

time	species	#	dir.	hgt.	remarks	loc.
0655	wedgetail	1	↑	low	50 yds off port	
0690	"	1	↓	"	200 yds off port	
0700	"	3	↑	"	100 yds off starboard	
0704	shearbirds	20±	↖	"	very compact, fast flying flocks - 500 yds out.	
0706	shearwater sp	1	←	"	1000 yds + off bow	
0708	Sterna sp	3	←	"	400 yds off port bow.	
0709	wedgetail	1	↑	"	200 yds off starboard	
0714	wedgetail ?	1	↑		6-800 yds.	
0715					ship stopped - plankton detail.	
0808	white n. petrel	1	↘	"	60± yds across bow.	
0812	underway				pure white under wing - no black mark.	
0817	wedgetail	1	→		100 yds off bow.	
0829	"	1	↓		400 yds off port	
0830	Sterna sp	2	→		1000 yds off starboard bow.	
0844	Sterna sp	1	←		" " "	
0849	"	1				
0850	R-T Tropicbird	1				
0851	Petrel	1	↘		750 yds off starboard	
0852	Petrel	1	←		400 yds off port	
0901	Petrel	1	←		400 yds off port	
0901	Petrel	1	→		800 yds off starboard	
0913	Bonin Petrel	1	→		75 yds off bow	
0920	Pterodroma	1	↘		2 mile	
0921	Bonin Petrel	1	~~←~~		100 yds	
0929	R-T Tropicbird	1		250'		
0931	Pterodroma	2				
0954	Pterodroma	1	←		1000 yds	
1009	Bonin Petrel	1	←			
1012	Pterodroma	1	↖			
1029	"	1	↖			
1033	Bonin Petrel	4	↖			
1045	Flock					
	Sooty tern	2			flying fish under flock - flock	
	wedge tail	2			actively feeding	
	white-necked petrel	1			very definite white neck seen	
	Bonin Petrel	15+				
	Pterodroma sp	4+			one had a definite dark neck	
	R-T Tropicbird	1			Feeding with flock (Dive one from ca 50'	
	ad dark shearwater	1				



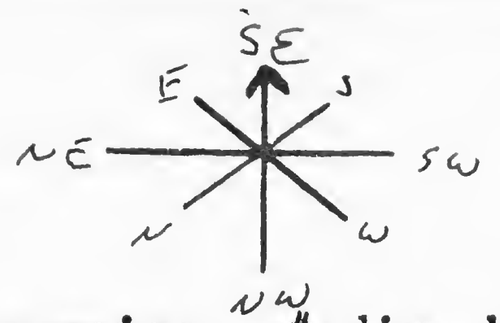


DATE 4 October 1963
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1101	Pterodroma	1	←			
1119	"	1	↘			
1135 / 1145	Bonin Petrel (2 IRP/AN ≡)	1	←		C-124, Due west, 8,000 FT.	
1211	Bonin Petrel	1	←		400 yds off bow one was probably the same as one sighted 1211	
1214	Bonin Petrel	2	←			
1217	Dark-rumped Petrel	1	©		400 yds off Starboard bow - all white underneath with dark underwing edges - grey above. larger than Bonin P., slightly lighter gliding quality, not as much of a slicing effect as Bonin to P.	
1231	Bonin Petrel	1	←		50 yds off bow	
1315	Fairy Tern	1	F			
	Sooty Tern	4	C	-		
	Petrel	1	K		- confirmed obs. by Dr. Ely. - Fairy Tern down into water, similar to Tropic Birds.	
1330						
1345	bird	2	↖	-	- bad light cond.	
1405	Wedge tail	1	→		50 yds off starboard bow. stop for plankton samples	
1415	under way					
1424	Bonin Is Petrel	1	←			
1526	R.T. Tropic	1	←◎	150 FT.	100 yds off Port	
1528	WedgeTail	2	←	10-15FT.	may have been sitting on H_2O.	
1616	Bulweria ?	1	↑	low	1st seen very near port bow.	
1635	white neck Petrel	1	↑	5-30		
1725	white-naked petrel	5	↘	30+	Dashed across stern - fairly close - well seen. flying high 30-50' + very fast.	
1730	Flock					
	Sooty Tern	25±			actively feeding flock -	collected
	Wedge-tail	125±			large school of Terns feeding below flock	2 wedge tail
	Bonin Petrel	2			flying fish jumping about	2 Sooty Terns
	Frigate-bird	5			Squid regurgitated from collected birds	6 Red footed Booby
	Red-Footed Booby	7+				
	Booby Sp -	25 ±			1 wedge tail had aluminum band # = 565-12118	
ca. 1840	underway again				flock thinned out but still present	
1904	wedgetail	1				
1911	Flock					
	Sooty tern	15 +			not actively feeding Gull appeared to have just been	
	Wedg tail	20+				
	Frigate bird	2				
1925	wedge tail	1				

DATE 4 October
Pg.# 3

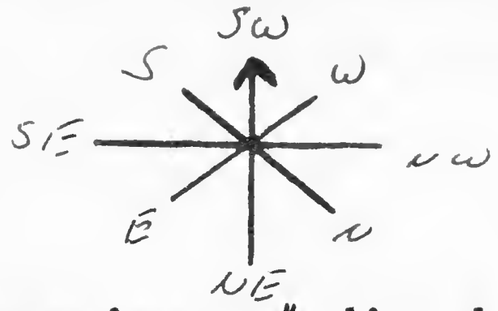
time	species	#	dir.	hgt.	remarks	loc.
1928	Wedge tail	2				
1929	" "	2				
1931	" "	1				
1932	" "	1				
1932	" "	1				
					observation ended 2010 Hours	



Starting time: 0550

DATE 5 October
Pg. # 1 2

time	species	#	dir.	hgt.	remarks	loc.
0650	Wedgetail	1	→		75 yds off bow	
0730					Stop for plankton sample	
0800					underway	
0808	R.T. Tropicbird	1	⑤		Shot by Bob	
0914	Bonin Petrel	1	SW			
0950	Bird	1	SE		low flying grey above white below, flew like a tern low to the water	
1041	Pterodroma	1	SE		800-1000 yds off Stbd. bow	
1141	New Zealand Shearwaters	3			grey larger than wedge tail wedge tail wing larger than ~~Stbd~~ in proportion to body more typical shearwater flight - very white below of the 3 birds were very light grey above (almost white) and 1 was a dusky grey.	
	wedge-tail ?	1			→ Once on water & one of above made a pass at this bird this bird looked like a wedge tail but flew differently much more gracefully as if lighter	
1203	Wedgetail	2	∞	—	one sitting on water, joined by other one	
1213	wedgetail	1	↑	—		
1305	Charge course					
1347	Pterodroma	1	→	—	— large.	
1353	Fairy Tern	2	↑	—	—	
	Shearwater	1				
1357	R.T. Tropicb.	1	∞	100'	—	
1548	Shorebird	1			heard it calling but could never see it.	
1555	White Tern	1	@ SSE			
1614	Bulwers Petrel ?	1	N			
1655	Red-tail Tropicbird	1	S		sitting on water - resettled on water ca 1 mile to south. Shook water from wings after arising from water	



DATE 5 October 1963
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1707	Wedgetail	1	NW		saw of the following two birds as they	
1707	"	2	NNW		rose from the water where they had been sitting	
1719	Shearwater	1	S		in flight & body proportions it most closely	
1926	Shearwater	1	→	~	resembled a Manx Shearwater, but it seemed too large - couldn't determine any color pattern	
					Observation ended ca 1930	

DATE 6 Oct. 1963
Pg.# 6 1

observation began 0602

time	species	#	dir.	hgt.	remarks	loc.
0710					stopped for Plankton Samples	
0814					underway again	
0957					Flying Fish 25 yds off starboard! good view "wings" noted	
0980					change course	
1014	Bonin Petrel	1	←		200 yds off bow	
1025	Turnstones	2	ns	–	flew over helo deck at height of 8 feet. One collided w/ R. Fleet when they returned.	
1030	Turnstone	1	ns	–	Remainder of pair again flew low over helo deck - collided by R. Fleet.	
1100	Christmas Is Shearwater	1	→			
1129	~~Large~~ Dark-rumped Petrel	1	→		large, white underneath including tail coverts appeared to have considerable white above as well. light back grey. Flopped 5 or 6 times + then glided.	
1141	Sooty Shearwater	2	→		We suspect they were sitting on the water. Silver underwing linings, brown bars on upper wings	
1145	~~Large Shearwater~~ Dark-rumped Petrel	1	↙		large ~~shearwater~~ Petrel, all white underneath including undertail coverts - underwing pure white with dark thin outer edges. Upper grey-brown with pattern of dark brown in field of light grey crossing wings 5 or 6 flaps & glide	
1230					dix. 315, a/c W	
1338	wedge-tailed	1	↑	on H_2O	on H_2O when 1st seen - ob. to take off + fly very low. staggered on H_2O to port then left as we passed. flew N to ship. white patch on 1. secondaries.	
1430					change course. Bearing ~~345~~ 045.	
1450	dark petrel	1	↙	low	very close to H_2O. observed off bow, flew to port. could not see tail. dark band on wings. fluttering flight (like nighthawk) possibly a Sooty Storm?	
1515	Bulwer's Petrel	1	∞			

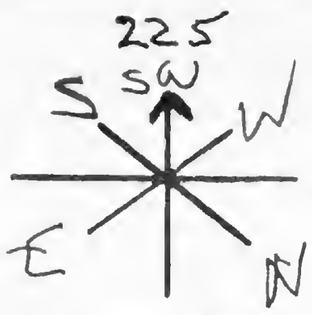
DATE 6 October
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1525	Flock				the 3 Shearwater-Petrels were feeding in an area where some small fish (Terns?) were jumping. Terns joined the shearwaters in small groups of ca 5-10 birds until from 6-7-12-13-56. the latter sighted and flew ← Approaching in front of a squall line.	
	Sooty tern	36				
	white necked Petrel	1				
	Pterodroma	1				
	wedge-tail	1				
1620	Flock				not actively feeding	
	Sooty tern	95±	1		Same hum. Terns in flock	
	white necked Petrel	2			flock in between 3 squall lines	
	wedge tail	1				
1636	SOOTY SHEAR?	1	↘		—	
1651	Pterodroma	1	0			
1705?	~~Broad~~ Petrel	1	↑		300 yds starboard	
1743	Pterodroma	1	⇐			
1755	Sooty Shearwater	1	↗			
1800	Sooty Shearwater	1	→		good 300 off bow	
1821	" "	1	→			
1823	~~Petrel~~ type ~~New Zealand~~ ~~Shearwater~~? Dark rumped Petrel	1	↑ ⇨		all white underparts, dark edges on wings, upper grey with V pattern on each wing - couldn't see black cap.	
1855	Flock	20+	↓		sighted 1000 yds to starboard & dropped rapidly to stern. Feeding.	
	Sooty Tern	4				
	Sooty Shearwater	1+				
	Wedgetails	6+				
	assorted Petrels and shearwaters	9+				
1906	Sooty Shearwater	1	→		apparently going to join flock.	
1940	finish observations					

cor Oct.
DATE ~~Sept~~. 7
Pg.# 1

Begin 0615

time	species	#	dir.	hgt.	remarks	loc.
0654	Red t. tr bird	1	→	150	300 yds across bow	
0718	Christmas Is Shearwater	1	→	low	200 yds " " , all dark, stiff wings, very fast	
					Wings appear long	
0818	Sterdrom	1	↶		far out.	
	plankton etc		0715 - 0800			
0833	large shearwater	1	→		visibility poor. (cloudy, haze, spray wind, etc.)	
0911	Pterodroma	1	→			
0914	white tern	2	↑	200ft	to stern flying into wind	
0925					wind 20 knots true	
					visability 2½ - 3 miles	
1030	R. T. Tropic bird	1	↑			
1110	wedgetail	1	↑		wind speed 17½ knots	
					we are now 110 mile from Johnston Atl.	
					wind 19.5 kts at 072 Slow flopping directly into wind + moving faster than ships. not following troughs	
1135	Wedge-tail	1	→		following wave troughs.	
1230					course change Bearing Magnetic 320, NNW.	
1452	white-necked petrel	1	↶		Excellent view of white neck + size.	
1512	Bonin Is Petrel	1	↷		500 yds on starboard	
1520	Wedgetail	1	SW			
1532	Wadgetail	1	→		400 yds off bow	
1617	Sooty Shearwater	1	←			
1617	Wedgetail	1	↙		500 yds off bow	
1625	Christmas Is Shearwater	1	←		501 yds off port	
1630	Wedgetail	1	→		500 yds off port	
1640	Booby?	1	↙	250-400 ft.	Dark, flapped continually, heavier bodied than Frigate passed behind ship 1000+ yds	
SW ↑ 225 1705	all dark Shearwater	1	←		gliding very high 20-40 ft. flapping hard 6 or 7 times and then gliding - 1000 yds off bow	



DATE Oct. 7
Pg. # 2

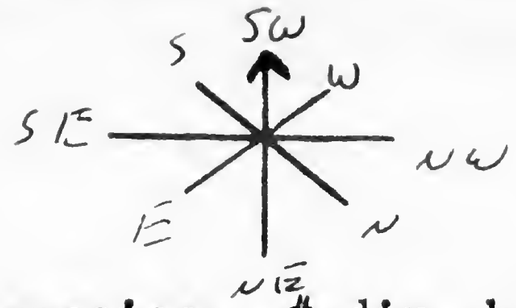
time	species	#	dir.	hgt.	remarks	loc.
1734	Wind.	1	E	—	—	
1800	White-necked Petrel	1	~~E~~ SE		Seen very clearly - white neck all the way around - flies like wedge tail	
1824	Shearwater-Petrel	1	N			
1927	Wedge tail	1	S			
1833	Flock					
	wedge tail	2				
	white naped Petrel	2				
	Shearwater	1				
1846	Bonin Petrel	2	←			
1853	Bonin Petrel	1	←			
1907	R.T. Tropic	1				
1923	Wedg-tail	1	SE			

dark above & even above - wings not 2 toned a wedge tail
white belly ~~dark~~ light brown

vertical crest
Fits description of Kermadec Petrel but did not fly in circle like a Pterodroma

observation ended 1930

ca	1930	Plovers?	2	©	seen by Currie & Ogawa	



DATE 8 Oct.
Pg.# 1

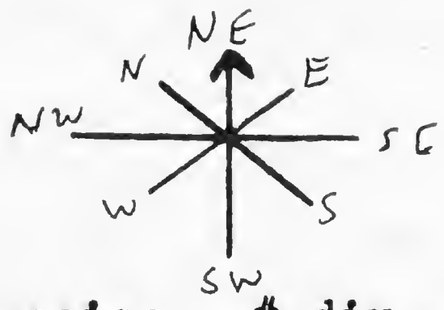
observations began 0635

time	species	#	dir.	hgt.	remarks	loc.
0445					ship's dead in water for several hours (loose gears a something)	
0756					underway	
0805	Pk. rump or wt-nckd petrel	1	SSE			
0836	white-vented Petrel	1	NW			
0935	Pterodroma	1	S			
0942	Bonin Is Petrel	1	SE		400 yds off bow	
1027	bird	1	S		800 yds off bow	
1031	Bonin Is Petrel	2	N		300 yds to starboard	
1051	Pterodroma	1	S		600 yds off bow	
1100	Pterodroma sp	1	S		800 ± yds off bow.	
1145	Pterodroma sp	1	S		500 ± yds off	
1145	~~bird~~ bird	2	??		looked like boobys or tern (soaring) ~ 1000+ yds off bow, ht. just above horizon but lost to view.	
1230	change course to			NW		
1437	Terns	3	SE	20' to W.T.	- flying fairly low over water. Two together + one trailing. Trailing bird set down on water.	
1510	wedge-tail	1	~~NE~~		flying slow + low always keeping in a trough (there one trough - sat on water -	
1639	white-vented Petrel	1	~~N~~			
1720	wedge-tail	1	SW			
1733					change course to NE ↑	
1807	bird	1	S		to port	
1809	Pterodroma Tahiti Petrel	4	SE	-	- to starboard	
1830	birds,	2	SE		500 yds to port	

NW ↑

obs. stopped 1935.

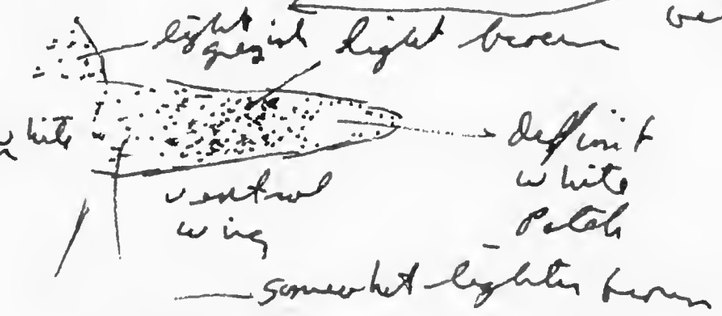
Sunset 1917

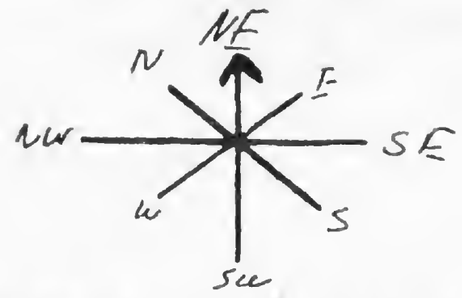


DATE Oct. 9, 1963
Pg.# 1

watch started at 0610 - light enough for visual obs. about 0700. wind ENE

Course NE 45 c

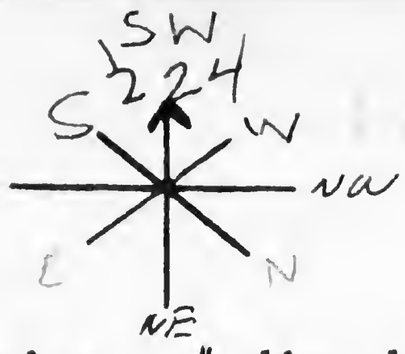
time	species	#	dir.	hgt.	remarks	loc.
0724	wedgetail	1	E		low to water, much flapping	
	white-n. petrel	2	E→N		clearly seen, 1 to within 100 yds of ship - with transmission	
0730	ship stopped for plankton				detail.	
0803	Turnstone	1	↻		flew around ship several times - shot at by Dr. Ely	
					departed to West 1815	
0825	Turnstone	1			Probably same turnstone returned in company of	
	Golden Plover	1			Golden Plover. Both collected by Dr. Ely.	
0928	Pterodroma	2	NNW			
1000	white-necked Petrel	1	NW		appeared to be trying to fly into wind but kept being pushed back & was gradually losing ground so that general direction was changed to NW	
1006	white-neck Petrel	1	NW		"	
1007	Bonin Petrel	1	NW		"	
1010	Sher- Pet.	1	S 1E		" only to S 1E	
1045	Flock					
	wedge-tail	15±			not actively feeding	
	Dark-rump Petrel	2				
	Bonin Petrel	2			one wedge tail dark on water	
	Kermadi Petrel	1				
	white-neck petrel?	1				
	Sooty Tern	8			resembled a white-neck in body	
	Pterodroma	5±			Proportions but wing appeared somewhat longer & narrower?	
					Stayed with flock until 1105	
1130	Bonin Ds.	1	↘			
1251	white-n-petrel	1	W-NW		150 yds rt port beam	
1300	Shearwater?	1	NE		3-400 yds Stbd. Beam.	
1305	Bird?	1	SW		~~350~~ 300 yds stbd. astern shearwater or petrel	
1308	Bonin Ds. Pet.	1	NW		50 yds across bow - very fast & erratic in high wind.	



DATE 9 Oct 63
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1320	~~Petrel~~ Pterodroma ?	2	→		600 yds. Port quarter	
1325	Pterodroma	1	SSE		100 yds. Traveling very FAST.	
1345	white N. petrel	1	NE		100-200 yds.	
1432	Bonin Is petrel	1	SE		100 yds off bow. traveling very fast.	
1505	Wedge-tail	1	SE		400 yds off bow	
1508	Wedge tail	1	SE		300 yds off bow	
1555	Bird	1	S	—	—	
1604	Sooty Shearwater	2	S		good view of silver under wing areas - flying very fast	
1605	Wedgetail	1	NE		400 yds off Starboard flying into the wind faster than ship	
1608	Dark Rumped Petrel	1	S		100 yds off Bow - good look - no white neck	
1608	Wedgetail	1	NE		may be (but probably wasn't) the same as at 1605	
1612	Dark Rumped Petrel. Wedgetail	1 1	NE		May be same birds as above at 1608.	
1613	Bonin Is Petrel	1	S		200 yds off bow.	
1653	White-necked Petrel	1	NE		400 yds off Starboard flying into wind	
1808	Pterodroma	2	NNW		300 yds across bow.	
1815	"	1	SSE		~~rising~~ rising very high in air	
1845	Bird	1	NNW		500 yds.	
1847	"	1	ESE		1000 yds.	

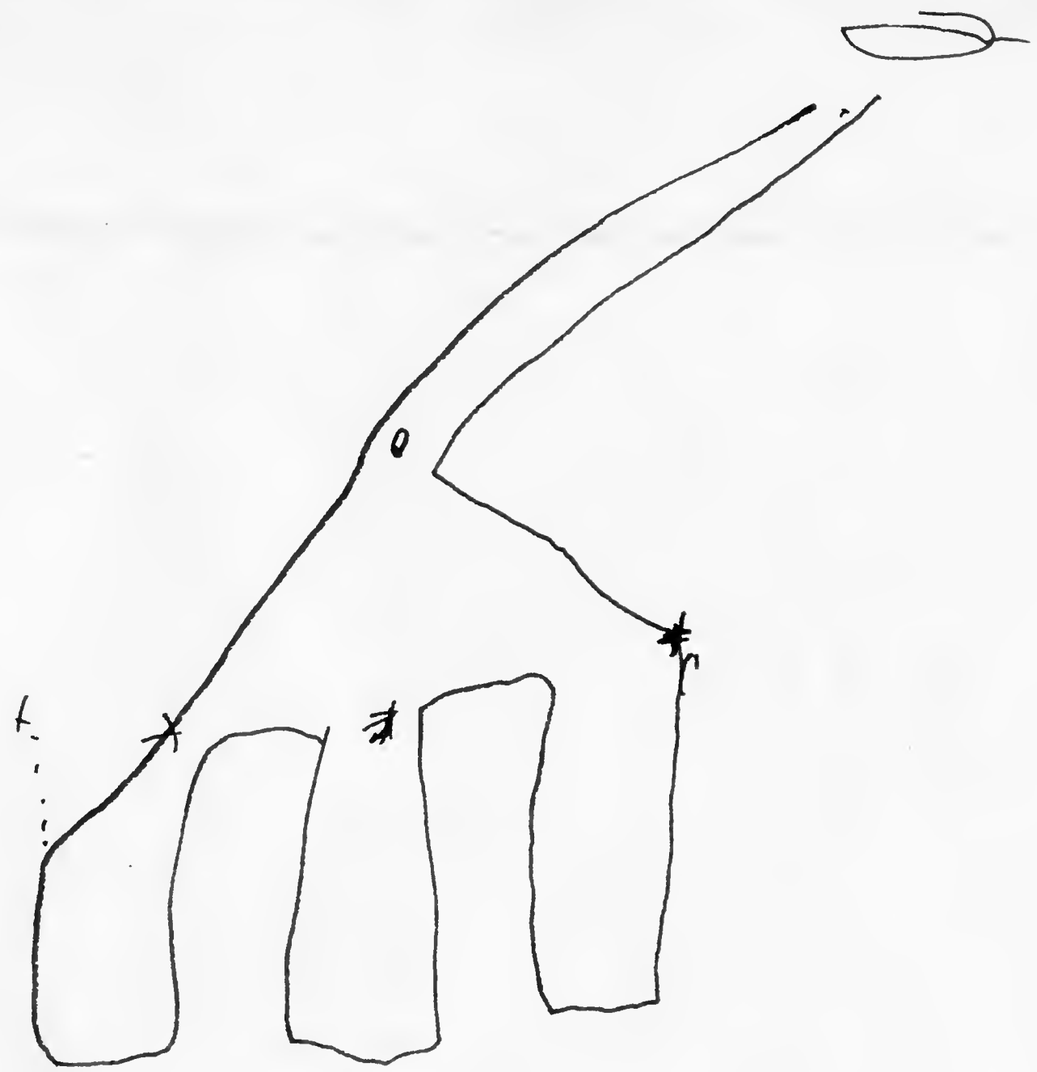
observation ended 1928

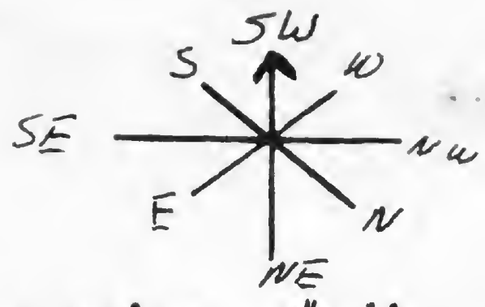


DATE Oct 10
Pg.# 1

obs. began at 0630

time	species	#	dir.	hgt.	remarks	loc.
					course 225, S.W.	
0720					all ahead slow. Plankton detail	
0735	W. Shearwater	2	NW	10ft.-	slow glide. Small amount of wing flapping	
0737	Harcourt's Storm Petrel	1	NW	low	white rump and fluttery flight clearly visible.	
0758	W. Shearwater	2	NW		same prob. same as above — were obs. several times during this period.	
0751	Bonin - do.	1		-		
0800					all ahead full. 220 - 5 SW	
0948	wedge tail	1	NE	low	100 yds off port flying into wind	
0953	Bonin Is Petrel	1	N		400 yds off bow	
1054	wedgetail	1	SE			
1129	tropic bird	1	SW	high	800 yds off starboard	
1157	White necked Petrel	1	N		200 yds off bow	
1208	W. Neck. Petrel	1	NW	5-10ft.	100-150 yds angle on bow.	
1220	Golden Plover	1		0-10ft.	Bird tried several times to land on water near ship at one point it hovered above H_2O lowered its feet almost touching water then flew up again circled ship many times	
1240	Bonin Petrel	1	NW			
1258	Bonin Petrel	1	NNW			
1310	W. N. Petrel	2				
1320	Flock				actively feeding —	
	Sooty tern	50+				
	Wedge tail	25±				
	Pterodroma	30±				
	White-naped Petrel	1				
	Dark rump Petrel	1				
	Kermadec petrel	1				
	Bonin Petrel	3+				
1339	Bonin Petrel	1				
1350	" "	1	SE			

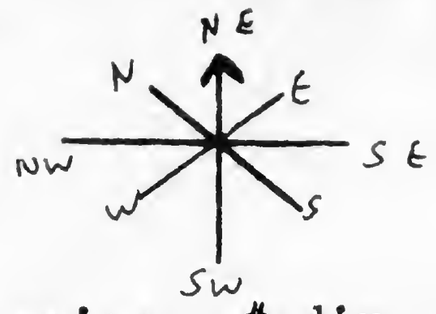




DATE OCT 10
Pg.# 2

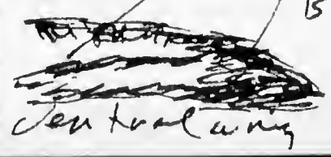
time	species	#	dir.	hgt.	remarks	loc.
1450	Bonin Petrel		SE			
1505	R.T. Tropic Bird	1	NE	100'	Sitting on water off bow - flew astern.	
1559	dark bird	1	S	low	—	
1613	PRETTY bird & shearwater	1	S	low	— didn't see well enough - appeared to have distinct dark bar on dorsal surface of wing - rest of dorsal wing surface light gray. Bar was gray not brown - ~~not~~ New Zealand Shearwater	
1628	RT Tropicbird	1	(S)	100'	Sitting on water to port bow but not one enough.	
1715					Change of course to NW	
1732	Wedgetail	1	E		100 yds off bow	
1745	Pterodroma	2	S		800 yds off port bow	
1752	Pterodroma	1	E		1000 yds off port bow.	
1926	wedge tail	1	E		60 yds off starboard bow.	
2100	mid birds	several			watch reported birds around + over ship	
2230	" "	5			" " " " " "	

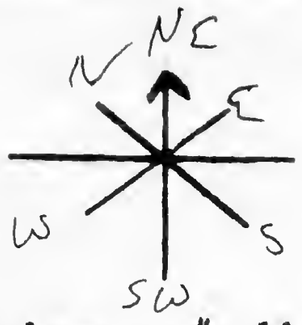
observ. stopped 1943



DATE oct. 11
Pg.# 1

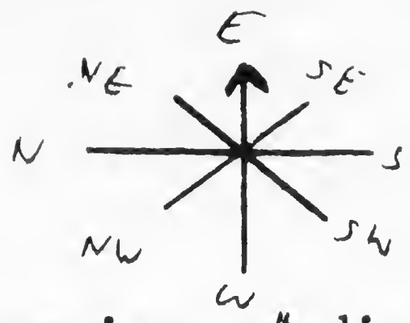
watch started 06:40 – squall + drizzle – heavy clouds
light enough for ob. about 0710

time	species	#	dir.	hgt.	remarks	loc.
0732	Wedgetail	1	SW	—	—	
0744	wedgetail	1	SE		100 yds off stern	
0749	dark bird petrel or shearwater	2	E	low	500± yds off starboard · glimpsed briefly · visibility very poor.	
0800	white-n. petrel	1	→ S		100 yds off port, crossed stern – good view.	
0802	" "	1	NE		100 yds off starboard, 11 to ship – poss. same bird.	
0825	birds	6-8	SW	low	flying low as a tern-like gracile (prob. dark shearwaters)	cor.
0835	Wedgetail	1	NE	—	—	
0855	FLOCK (Sp)	39	N	30' to W.T.	—	
	Christmas Is.?	39	S/SSE		flight typical shearwaters – no white seen — direction questionable since ship was drifting for plankton detail cor	
0902	wedgetails	2	W	—	—	
0902	Bonin Is.	1	E	—	—	
0905	Golden Plover?	2	E	-	-	
0905	FLOCK of Shearwaters	35+	S/SSE	—	—	
0917	Flock Shearwaters	18+	on/SSE S			
0920	Pterodroma	1	SW			
0927	Bonin Petrel	1	SW			
0930	Flock Shearwaters	25	S/SSE SW		Probably all dark	
0934	Dark Shearwater, Larger than Bulwer's	1	S/SSE S		Larger than Bulwer's Petrel – no silver appeared on ventral wing surface but light was very poor.	
0935	Wedgetail S.	1	NE			
0940	dark Shearwater	1	S/SSE S		to starboard	
0942	Small Pterodroma	1	S		off Port silver flash / Back pattern that of a Pterodroma  Central wing	



DATE Oct 11, 1963
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
0946	Flock	[illegible]	S			
	Curlews?	21		50 ft	longer than plovers appeared	
	Dark Shearwaters	6	S/SSE	low	whitish gray	
0948	Shearwaters dark	2	S	low	chunky bill? pkg	
1000	dark Shearwaters	4	S	low to 30 ft		
1006	dark shearwaters	4	S			
1006	Christmas Is Shearwater	1	SE			
1014	Sooty Shearwater	1	SE			
1015	Bonin Is Petrel	1	NE			
1017	Pterodroma	1	SE			
1020	Frigatebird	1	©			
1021	Pterodroma	1	W		port to stern	
1026	dark shearwaters	28	S/SSE S		astern port	
1026	Bonin Is Petrel	1	W			
1031	White Headed Petrel	1	E			
1047	Bonin Is Petrel	1	NW			
1047	Shearwaters Petrel	1	S		right at edge of rain squall	
1105	Wedgetail E	1	NE			
1125	dark shearwaters	8	S/SSE S			
1130	dark shearwaters	5	S S	SSE		
1142	dark shearwaters	10	S S	SSE		
1146	Wedgetail S.	1	E			
1150	Shearwaters	20+	C	S/SSE	not the same as previous flocks - these appeared to	
1159	dark shearwaters	30±	S	S/SSE	be circling, maybe feeding	
1242	wedgetail?	1	S		light phase, but definitely a white bellied shearwater.	
1245	shearwater?	1	S		may have been New Zealand. Brief close look.	
1300	Sterna bergii	2	S		Sub. Sterna bergii	
	Change course to 090 G.					
1303	dark shearwaters	1	S	S/SSE	20 yds off low - extremely fast Davis	
1322	Sterna bergii	1	S		150 yds off bow.	
1329	~~Christm~~ dark shearwater	16±	S	S/SSE	500 yds. same flight as other flocks	
	shearwater	1	S		" could not see well.	



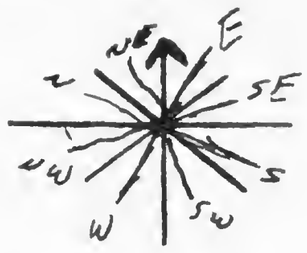
DATE Oct. 11, 1963
Pg.# 3

time	species	#	dir.	hgt.	remarks	loc.
1425	Bonin Petrel	1	NE	5-10		
1454	Sooty Shearwater	9	S		obs. same as previous flocks.	
1623	Wedgetail	1	S			
1735	Dark Shearwater	1	S			
1804	Sooty Shearwater	25±	S			
1808	Frigate	1	E			
1830	Bonin Pet	1	S			
1832	Sooty Tern	2	E		13th shot by bob Fleet 1 ad & 1 brown. both collected	
					Observations ended 1930	

DATE Oct. 12, 1963
Pg.# 1

start watch 0645 stormy wind; sea low

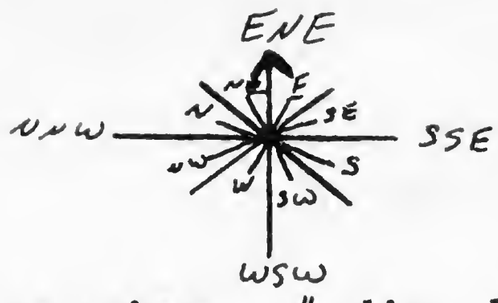
time	species	#	dir.	hgt.	remarks	loc.
0717	wedgetail	1	SE→NW	—	←	
0750	Shorebird	1	W	250'	— prob. Plover or Tatler	
0759	Wedgetail	1	S	—	—	
0820	Golden Plover	1	E			
	Turnstone	1	E		} flying together, Bot shot - plover apparently unhurt	
0831	wedge tail	1	N			
0841	Wedge tail	1	[illegible]	—	—	
0842	"	1	[illegible]	—	—	
0843	Pterodroma	1	N	—	—	
0845	Wedgetail	1	E	—	- possibly same bird as above.	
0852	Petrel?	1	ENE	80'	—	
0853	Turnstone	1	"	30'	—	
0900	shearwaters	11	S			
0900	frigate	1	E			
0907	wedgetail	1	N			
	shearwater sp	1	N		100yds out	
0922	dark shearwater	5	SE	}	Sooty/ slender-billed (reliability of 3)	
0950	" "	2	SSE		short rapid strokes for few seconds then longer period of gliding (fly like Sooty Shearwater) light poor so can't be sure of colors or pattern)	
or 0956	Golden Plover	1	ENE	5'		
1002	Shear-pat	1				
1007	Golden Plover	2	ENE			
1035	Wedge tail	1	WSW			
1041	dark Shearwater	3	SSE		— Sooty/slender-billed?	
1048	Shearwater	2	SSE			
1053	wedge tail	2	NW			
1057	Bird	1	SSE			
1059	Bonin Petrel	1	WSW		Bonin/slender-billed?	
1105	dark Shearwaters	7	S		—	
1104	Bonin petrel	1	WSW			
1110	wedge tail	1	ENE			



DATE 12 Oct 1963
Pg.# 2

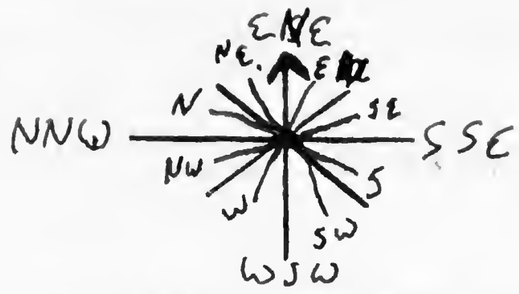
time	species	#	dir.	hgt.	remarks	loc.
1132	Common Noddy Tern	2	ENE	5'	large + all brown	
1143	Bonin Petrel	1	SSW			
1220	dark tern	3	SE	low	either noddy or sum. Sooty.	
1226	golden plover	6	NE	low	flew right over deck,	
1230	frigate	1	W		high ff starboard beam	
1236	dark tern	4	E		either noddy or sum. Sooty	
1318	wedgetail	1	SE			
1413	Sooty Shearwater	3	S		good look at silver ventral wing surface.	
1429	booby	1	SW.		either masked or red-footed. in from SW across bow then back across bow to SW.	
1440	Flock	27+			feeding flock	
	Frigate b.	10				
	White Tern	3				
	Booby sp	4+			1 booby shot by Dr. Ely	
	Wedgetail S.	10+				
	Red-Tailed Booby	1			collected by	
1450	Golden Plover?	5				
1510	Golden Plover	5			± 5 bird wounded	
1517	Shearwater	1				
1522	Shearwater	1				
1553	G. Plover	5	E			
1601	R.F. Booby	1	W			
1606	AIRCRAFT	1			C-124, NE at 7,500 ft.	
1622	R.F. Booby	1	SE	30 ft		
1635	FRIGATE	1	NNE	150+		
~~1641~~						
1649	Frigate	1	NE	200+	falling slowly astern - alone	
1706	Shearwater	1	SW	10-30	to 20' of water.	
1809	Pterodroma	1	SE			
1821	Shearwater Sp.	1	SE			
1825	dark tern?	1	NE		flapped continually. beating directly into wind	
1834	Manx Shearwater?	1	SE		Dark backed shearwater w/ white ventral surface. flapped + glided	
1835	Pterodroma	1	SE			
1850	Pterodroma	1				
1856	Sooty Shearwater	11	SE			

observation ended 1910



DATE 13 Oct. 1963
Pg.# 1

time	species	#	dir.	hgt.	remarks Observation began 0618	loc.
					Steering 070. E.N.E.	
0736	Bird	1	SSE		seemed brisk watch	
0745	Pterodroma sp	1	NNW	5-20ft.	300 yds astern. white underneath noted only.	
0904	"	1	SSW			
0809	Bird	1	S		Lost in glare of sun.	
0815	Pterodroma	1	S			
0906	dark shearwater	2	S		not flying as fast as sooties - silver underwing not seen but light was poor - flight lighter	
0915	Pterodroma	1	S		Close to bow	
0948	Shearwater	1	SE	—	—	
0953	White-naped P.	1	SSE		very close to bow	
0958	Golden Plover	2	N		close to ship	
1006	Golden Plover	2	SSE		Most likely same two. didn't circle ship on either occasion	
1009	Golden Plover	2	N		Same two again	
1045	SHEARWATER	1	ENE	—	—	
1059	Shearwater?	1	SSE	—	—	
1059	Bonin Is.	1	NNW	—	—	
1220	tern sp	1	ESE			
1235	small petrel	1	SSE		150± yds off bow.; gray above, prob.. small Pterodroma but flew different. mostly gentle flap + glide rather than scaling.	
1240	Bonin Is Pet	1	ENE		11 to port bow	
1318	Bonin Is. Pet.	1	ENE			
1340	G. Plover	1	NNE.		flying with ship.	
1348	B. I. Petrel	1	NNE			
1352	" "	2	SSE			
1352	" "	1	NNE			
1400	" "	1	NNE			
1406	Pterodroma sp	1	SSE		1000 yds ° ft starboard bow.	
1413	Pterodroma sp	1	SSE		Looked dark under wing	
1415	G. Plover	1	ENE			
1425					shot by Dr. Ely.	
1430	G. Plover	1	ESE		→ FISH NET BALL, GREEN, 10 inch. RETRIEVED apparently wounded. (?) Lost in sun glare.	
1459	Pterodroma sp	2	SSE			
1527	Pterodroma	1	SSE			
1532	Bonin Petrel	1	SSE			

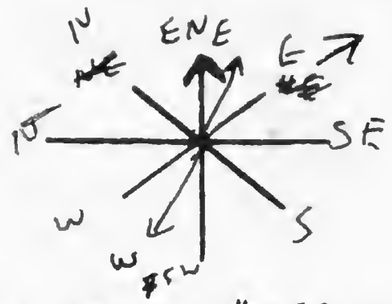


DATE 13 Oct 63
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1537	Pterodroma	1	SSE		way off b bow	
1546	Wedgetail	1	WSW		flying with wind very fast	
1551	Pterodroma	1	S		far out off port bow	
1557	Bonin Is Petrel	1	NW		250 yds off port bow	
1611	Pterodroma	1	S		400 yds off bow	
1619	Pterodroma?	1	SSE		all light grey on dorsal surface	
1620	Bonin Is. Petrel	1	SSE			
1621	Pterodroma	1	SSE			
1622	Pterodroma	1	SSE		off starboard bow 600 yds	
1623	Pterodroma	1	⇨		450 yds off bow	
1627	Pterodroma	1	ENE		200 yds to port flying into wind - not Bonin Is.	
1631	Pterodroma	1	SSE		700 yds off starboard	
1640	Sooty Shearwater	5	S		400 yds off bow. good view	
1643	Pterodroma	2	SSE		700 yds off bow	
1645	Pterodroma	1	SSE		700 yds off bow	
1647	Dark-Rumped P.	1	↱		came up on starboard 200 yds out + veered to SSE. good look	
1651	Pterodroma	1	ENE ~~NE~~		500 yds off starboard flying into wind	
1659	Pterodroma	1	SSE		750 yds off starboard bow	
1659	Pterodroma Sooty Shearwater	1 1	SSE		300 yds off bow	
1702	Bonin Is Petrel	1	NNW		300 yds off bow	
1714	bird	1	NNW		800 yds off bow	
1715	Pterodroma	1	SSE		300 yds off starboard bo	
1718	Pterodroma	1	SSE		all light grey on ~~be~~ dorsal surface 500 yds on starboard bow	
1724	Bonin Is Pet	1	SSE		50-60 yds off bow	
1735	Pterodroma	1	⊘			
1735	Sooty Shearwater	1	SSE			
1740	Bonin Petrel	1				
[redacted]	new zealand shearwater?	1				
1744	Bonin Petrel	1	NNW			
[redacted]	Pterodroma	1	NNW			
1745	Pterodroma	1	NNW			
1756	Pterodroma	3	⊚		Flock circling	
	Bonin Is Petrel	2				
1802	Bonin Petrel	1	NNW			
1802	Bonin Petrel	1	SSE			

DATE 13 Oct 63
Pg.# 3

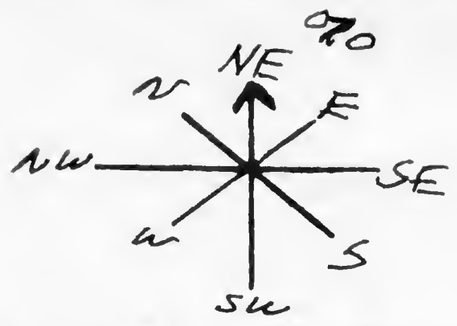
time	species	#	dir.	hgt.	remarks	loc.
1802	White-necked Petrel	1	E		good look	
1805	RT Tropicbird	1	E ENE			
1805	Ptaudroma	1	SSE			
1813	Bonin Is Petrel	1	WSW			
1815	Sooty Shearwater	1	SSE		good look	
1820	Dark Rumped P.	1	ENE		flying into wind 300 yds on starboard	
1829	Bonin Is Petrel	1	SSE			
1830	Golden Plover	1	NE			
1842	GOLDEN PLOVER	1	ESE	—	—	
1845	BONIN IS	1	NW	—	—	



DATE Oct. 14, 1963
Pg.# 1

obs. started at 0625 - still murky - sea much lower. sky mostly cloudy

time	species	#	dir.	hgt.	remarks	loc.
0816	Sooty Shearwater	1	S	low	clearly seen, 300 yds off bow.	
0852	White-necked P.	1	NW			
	Pterodroma common	1	N			
0918	Noddy Tern	1	SES	low	fast wing flaps.	
0928	Pterodroma	1	N			
1033	Black-footed Albatross	1	WSW		observed close to ship by Col Currier who has had over 1 years experience around this species - well seen by him —	
1037	Red-tail Tropicbird	1	SE			
1121	Sooty Shearwater	2	SSE		at edge of rain squall	
1228	Petrel or Shearwater	1	ENE		500 yds off port	
1237	Wedgetail	2	SE		150 yds from bow	
1242	Sooty Shearwater	1	SE			
1258	Wedgetail	1	NW		150 yds off bow	
1308	Bonin Is. Petrel	2	NW		very close to bow	
1340	Bulwers P. ?	1	SE			
1352	dark Shearwater	1	S			
1406	dark Shearwater	1	S			
1409	Golden Plover	1	E			
1409	dark Shearwater	1	S			
1414	Bulwers Petrel?	1	S			
1531	wedgetail	1	E		800 yds off port	
1500					course 65 ENE	
1530	Pterodroma	1	SW			
1550	Harcourt Storm Petrel	1	NW		fairly close to ship; fluttery flight, white wings, stopped several times to "dabble" in H_2O. watched for several minutes	
1551	Shearwater	1	SSE			
1553					Testing on Bridge, No shooting yds CAE BRD	
1600	Bonin Petrel	1	SSW			
1620	" "	1	SSW			
1630					course 070 ENE	
1647	Pterodroma	1	SE		Resume firing	
	Sooty Shearwater	1	SE		wing flaps seen.	
1710	G. Plover	2	NNE			
1715	" "	1	SSE			

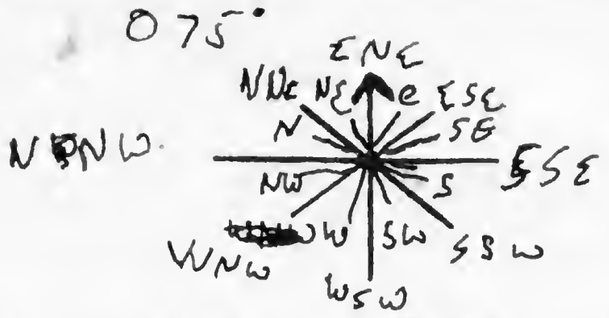


DATE Oct. 14, 1963
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1725	dark Shearwater	1	S			
1730	golden Plover	3	ENE	15-20	Passing ship.	
1737	Bonin Petrel	1	ESE			

observation ended 1840

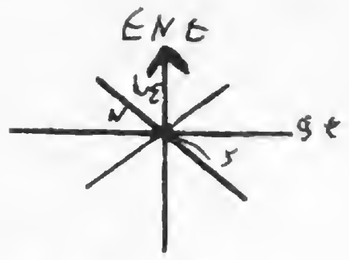
075°



DATE Oct 15
Pg.# 1

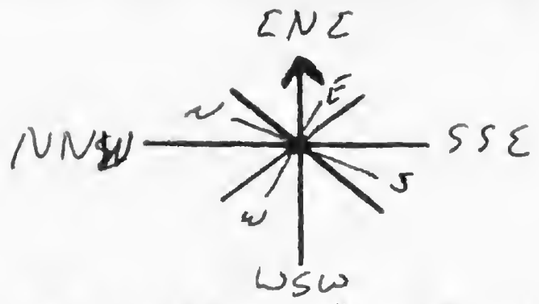
Offs. Wgun 0629

time	species	#	dir.	hgt.	remarks	loc.
0655	G. Plover	1	ENE	60' to WT.	from 60' to wave Tops —	
0747	Pterodroma	1	NNE	—	~	
0756	Boobys.	1	SSE	—	— trying to tack upwind but not making it!	
0806	Manx Shearwater	1	WSW		very good look. Typical shearwater flight. Dark above & white below with white appearing to come up a bit higher behind wings. Ventral wing surface mostly pure white, thin dark leading edge. flying with wind	
0811	Bonin I. Petrel?	1	NW		small petrel 500yds to starboard	
0837	Wedge tail	1	SSE		400yds off bow	
0914	Bonin Petrel?	1	W		600yd off Port	
0921	Manx Shearwater	1	N		50-75yds off bow	
0945	Pterodroma	1	NW		300 yds port	
0949	white-tail Tropicbird	3	ENE	~~400'~~ 250'	~~2 miles above~~	
0958	Wedge-tail	2	ENE		1 dark Phase 1 light phase 100-200yds starboard	
1002	Pterodroma	1	N		off fan port	
1008	Wedge tail	1	ENE		60yds off starboard (light phase)	
1012	" "	1	ENE		" " " (dark phase) joined previous	
1019	Bonin Petrel	1	S			
1022	W-T Tropicbird	1	ENE		got up off water - shook water off feathers in mid air by shaking whole body twice	
1025	Bonin Petrel	1	N			
1036	Plover	1			heard only	
1050	masked Booby	1	SSE		black on tail, massive yellow bill - close fan ca 50'	
1127	Bonin Petrel	2	SE		ad. all white except wing tips & tail black — first seen by Bob R. Davis	
1145	G. PLOVER	1	ENE	75 ft.	Heard, seen & located. 12 M.P.H.	
1151	Wedge Tail	1	ENE	1-15 ft.		
1215	Pterodroma	1	SSW			



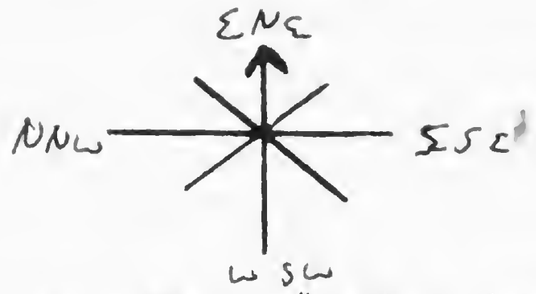
DATE Oct. 15
Pg.# 2

time	species	#	dir.	hgt.	remarks	loc.
1220	n. t. tropic bd	1	E		leading astern of ship - bird from 100+ ft.	
1227	golden plover	1	ENE	10'	over ship	
1235	wedge tail	1	SE			
1243	n.t.t. bird	1	"		egg - had been sitting on water - but not seen until 100yds off.	
1246	Grey backed Tern ?	2	ENE	30'	- light grey brown backs.	
1314	Pterodroma	1	S	—	—	
1325	Pterodroma	1	WSW	—	—	
1325	Masked Booby	1	"	—	adult	
1345	Pterodroma	2	S	-	-	
1351	Pterodroma	1	SE	—	—	
1355	Bonin Is. "	1	NW	—	—	
1412	Bonin Is.	1	SE	—	—	
1420	Pterodroma	1	SE	—	—	
1450	Large Pterodroma	1	SE	—	—	
1456	Pterodroma	1	S	—	—	
1500	Golden Plover	1		30-40'		
1511	Pterodroma	1	S	—	—	
1513	Wedge tail	1	ENE			
1514	Pterodroma	1	SSE			
1524	Bonin Petrel	1	SSE			
	New Zealand Shearwater	1	SSE		very definite Ely, Gould, Long	
1530	Manx Shearwater	1	NNW			
1531	Pterodroma	1	SW			
1534	"	1	SW			
1543	"	1	SW			
1544	Golden Plover	1	O			
1548	Shearwater	2	N		typical shearwater flight	
1549	Shearwater	1	S		all grey on dorsal surface - typical shearwater	



DATE 15 Oct 63
Pg.# 3

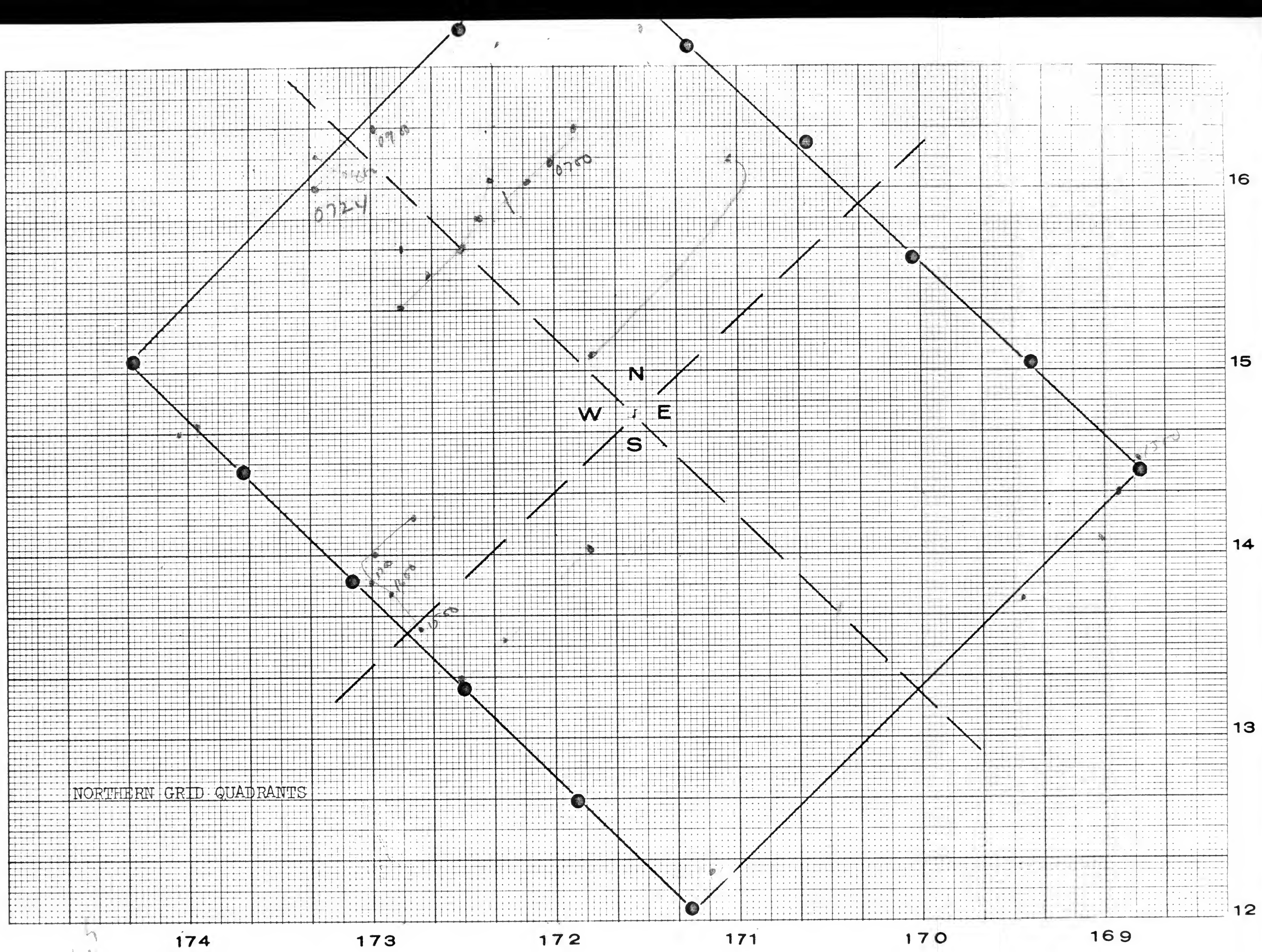
time	species	#	dir.	hgt.	remarks	loc.
1548	Pterodroma	2+	SSE			
1548	Shearwaters	2	⇨		1 all gray on dorsal · white ventral typical	
1550	Pterodroma	1	NE		shearwater flight - also brown probably Wedge-tail	
1553	Shearwaters	2	S			
1602	Wedge-tail	1	NNW		light phase	
1604	" "	1	NNW		" "	
1605	" "	1	NNW		" "	
1614	Bonin Petrel	1	SSE			
1615	Wedgetail	1	ENE			
1620	Wedgetail	2	ENE		turned to NNW across bow of ship	
1622	wedgetail	1	NNW			
1623	Manx Shearwater	1	NNW			
1625	Bonin Petrel	1	WSW			
1626	Manx S.	1	NNW			
1627	Manx S.	2	NNW			
1629	Pterodroma	2	⇦ NNW			
1630	Pterodroma	1	[illegible]			
1632	Pterodroma	1	SSE			
1635	Pterodroma	1	SSE			
1639	Pterodroma	1	SSE			
1642	Manx S. ?	1	NNW			
1644	Pterodroma	1	NNW			
1645	Manx S.	1	SSE			
1646	Bonin Is	1	NNW			
1646	Wedgetail	1	NNW			
1653	Wedgetail	7	NNW		not really a flock - loose + straggly	
1654	Manx S.	1	SSE			
1655	Pterodroma	1	NNW			
1657	Bonin Is	1	W		Shot at	
1658	Wedgetail	1	NNW			
1702	Shearwater/Petrel	3	SSE		all grey back - all white ventral ??? good view sailed very high one had grey under wings	



DATE 15 Oct 63
Pg. # 4

time	species	#	dir.	hgt.	remarks	loc.
1703	Bonin Is	1	SSE			
1707	Shearwater	1	SSE		grey dorsal surface - dusky breasts stomach - pearlier wing pattern ? very high scaling	
1710	wedgetail	1	SSE			
1712	Manx Shearwater	1	SW			
1713	wedge tail	1	WSW		dark phase	
1715 to 1723	FLOCK					
	wedge tail	30+			actively feeding - flying fish school Comm and Sooty terns diving. birds immediately attracted to area where fish jump — all wedge-tails apparently light phase —	
	Sooty tern	3				
	Common Noddy	1				
1729	Pterodroma	2	SSE			
1729	Manx Shearwater	2	NNW			
1738	Shearwater	1	NNW		high scaling but far off	
1740	Wedgetail	1	S			
1742	Golden Plover	1	O			
1743	Wedge-tail	1	WSW			
1754	G. Plover	1			Heard only.	
1757	G. Plover	1	SSE		1754 entry crossed bow to SSE	
1757	wedge Tail	2				
	Sooty Tern	1				
1801	Bonin Petrel	1	NNE			
1808	Shearwater	1	SSE			
1812	Shearwater	1	NNW			
1815	Bonin Petrel	1	SSE			
1822	Pterodroma	1	NNW			
1823	Shearwater	1	SSE		same bird as before ??	
1826	unid. tropic bird	1	ENE			

observation ended 1835



BEE 20x20 TO INCH

October 1963

Locality

DATE	MILES FROM OAHU 1200	MILES FROM OAHU 2900	MILES FROM Johnst. 1200	MILES FROM Johnst. 2900	s/s	SR	MILES ss to SR	TRAVELED DARKNESS
1	105	125 WSW	724 ENE	599 ENE				
2	223 WSW	267 WSW	501 ENE	457 ENE				
3	398 WSW	490 WSW	326 ENE	234 ENE				
4	649 WSW	726 WSW	76 ENE	26 S				
5	749 WSW	869 WSW	131 SSE	224 S				
6	950 WSW	864 WSW	292 SSW	185 SSW				
7	769 WSW	846 WSW	102 S	138 SW				
8	962 WSW	932 WSW	260 SW	214 SW				
9	857 WSW	806 WSW	132 WSW	81 W				
10	945 WSW	1000 WSW	321 WSW	277 WSW				
11	893 W	794 WSW	177 W	76 W				
12	728 WSW	623 WSW	5 NNW	101 ENE				
13	505 WSW	410 WSW	219 ENE	314 ENE				
14	307 WSW	226 WSW	417 ENE	498 ENE				
15	124 WSW	—	600 ENE	—				

Od total sky

Inside	6	7	8	9	10	11
1	.4	.4	.6	1.0	1.0	1.0
2	.5	.5	.6	1.0	1.0	1.0
3	.4	.5	.4	1.0	1.0	
4	.3	.5	.5	1.0	1.0	
5	.2	.4	.4	1.0	1.0	
6	.2	.4	.5	1.0	.8	
7	.4	.3	.4	1.0	.8	
8	.5	.3	.4	1.0	.7	
9	.4	.4	.4	1.0	1.0	
10	.6	.5	.6	1.0	1.0	
11	.6	.5	.5	1.0	1.0	

44

40

33

5
3 9
2 1

2 9 6
5 3 2 7

5 3 3 1
3 3

3 6

.73
.76
~~.76~~ .71
~~.6~~ .71
~~.60~~ .67
~~.58~~ .65
~~.58~~ .65
~~.58~~ .65
~~.64~~ .70
~~.74~~ .78
~~.72~~ .76

Inside	2	3	4	5	12	13	14	15		
1	.6	.6	1.0	.8	1.0	.4	.6	.3	53	.66
2	.6	.3	1.0	.7		.6	1.0	.3	54	.68
3	.8	.4	1.0	.5		.8	1.0	.6	61	.76
4	1.0	.3	1.0	1.0		.6	.6	.5	60	.75
5	1.0	.4	~~1.0~~ 1.0	.8		.8	.6	.4	59	.74
6	.7	.3	1.0	.3		.9	1.0	.4	56	.70
7	.8	.7	1.0	.3		.8	1.0	.2	58	.73
8	.7	.5	1.0	.6		.6	1.0	.1	55	.69
9	.8	.5	.8	.6		.3	1.0	.1	51	.64
10	.7	.5	~~1.0~~	.5		.4	1.0	.1	49	.61
11	.6	.5	1.0	.7		.2	.9	.3	52	.65

TABLE 15

Conversion Tables for Thermometer Scales

F=Fahrenheit, C=Celsius (centigrade), K=Kelvin

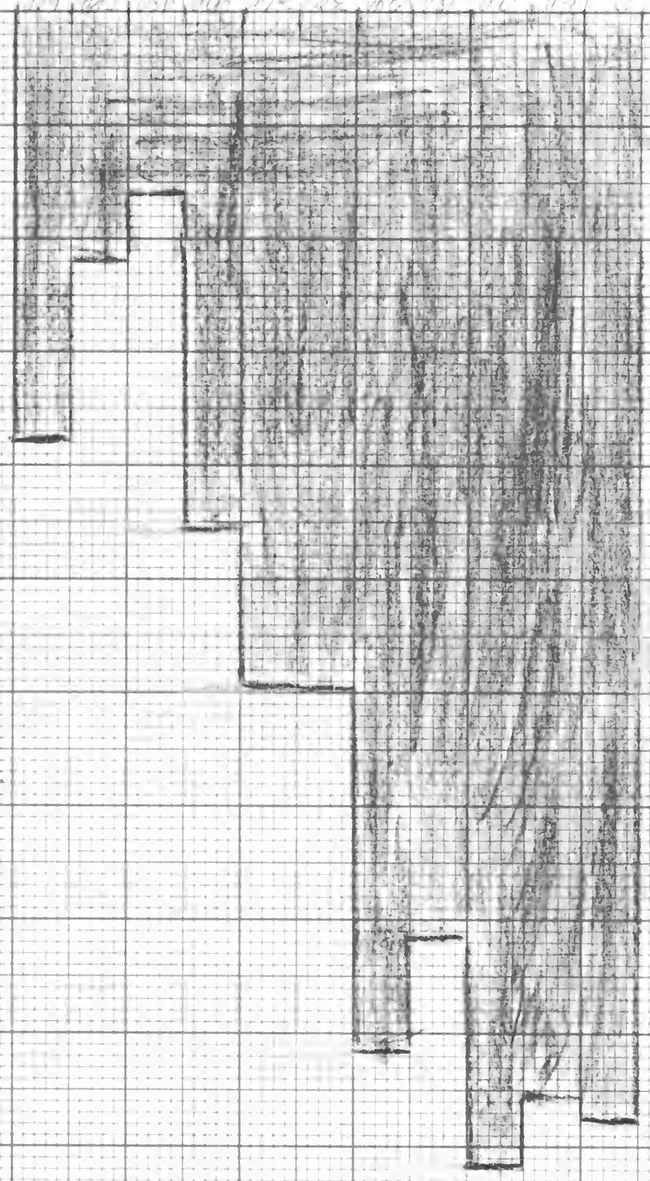
F	C	K	F	C	K	C	F	K	K	F	C
°	°	°	°	°	°	°	°	°	°	°	°
−20	−28.9	244.3	+40	+4.4	277.6	−25	−13.0	248.2	250	−9.7	−23.2
19	28.3	244.8	41	5.0	278.2	24	11.2	249.2	251	7.9	22.2
18	27.8	245.4	42	5.6	278.7	23	9.4	250.2	252	6.1	21.2
17	27.2	245.9	43	6.1	279.3	22	7.6	251.2	253	4.3	20.2
16	26.7	246.5	44	6.7	279.8	21	5.8	252.2	254	2.5	19.2
−15	−26.1	247.0	+45	+7.2	280.4	−20	−4.0	253.2	255	−0.7	−18.2
14	25.6	247.6	46	7.8	280.9	19	2.2	254.2	256	+1.1	17.2
13	25.0	248.2	47	8.3	281.5	18	−0.4	255.2	257	2.9	16.2
12	24.4	248.7	48	8.9	282.0	17	+1.4	256.2	258	4.7	15.2
11	23.9	249.3	49	9.4	282.6	16	3.2	257.2	259	6.5	14.2
−10	−23.3	249.8	+50	+10.0	283.2	−15	+5.0	258.2	260	+8.3	−13.2
9	22.8	250.4	51	10.6	283.7	14	6.8	259.2	261	10.1	12.2
8	22.2	250.9	52	11.1	284.3	13	8.6	260.2	262	11.9	11.2
7	21.7	251.5	53	11.7	284.8	12	10.4	261.2	263	13.7	10.2
6	21.1	252.0	54	12.2	285.4	11	12.2	262.2	264	15.5	9.2
−5	−20.6	252.6	+55	+12.8	285.9	−10	+14.0	263.2	265	+17.3	−8.2
4	20.0	253.2	56	13.3	286.5	9	15.8	264.2	266	19.1	7.2
3	19.4	253.7	57	13.9	287.0	8	17.6	265.2	267	20.9	6.2
2	18.9	254.3	58	14.4	287.6	7	19.4	266.2	268	22.7	5.2
−1	18.3	254.8	59	15.0	288.2	6	21.2	267.2	269	24.5	4.2
0	−17.8	255.4	+60	+15.6	288.7	−5	+23.0	268.2	270	+26.3	−3.2
−1	17.2	255.9	61	16.1	289.3	4	24.8	269.2	271	28.1	2.2
2	16.7	256.5	62	16.7	289.8	3	26.6	270.2	272	29.9	1.2
3	16.1	257.0	63	17.2	290.4	2	28.4	271.2	273	31.7	−0.2
4	15.6	257.6	64	17.8	290.9	−1	30.2	272.2	274	33.5	+0.8
−5	−15.0	258.2	+65	+18.3	291.5	0	+32.0	273.2	275	+35.3	+1.8
6	14.4	258.7	66	18.9	292.0	+1	33.8	274.2	276	37.1	2.8
7	13.9	259.3	67	19.4	292.6	2	35.6	275.2	277	38.9	3.8
8	13.3	259.8	68	20.0	293.2	3	37.4	276.2	278	40.7	4.8
9	12.8	260.4	69	20.6	293.7	4	39.2	277.2	279	42.5	5.8
+10	−12.2	260.9	+70	+21.1	294.3	+5	+41.0	278.2	280	+44.3	+6.8
11	11.7	261.5	71	21.7	294.8	6	42.8	279.2	281	46.1	7.8
12	11.1	262.0	72	22.2	295.4	7	44.6	280.2	282	47.9	8.8
13	10.6	262.6	73	22.8	295.9	8	46.4	281.2	283	49.7	9.8
14	10.0	263.2	74	23.3	296.5	9	48.2	282.2	284	51.5	10.8
15	−9.4	263.7	+75	+23.9	297.0	+10	+50.0	283.2	285	+53.3	+11.8
16	8.9	264.3	76	24.4	297.6	11	51.8	284.2	286	55.1	12.8
17	8.3	264.8	77	25.0	298.2	12	53.6	285.2	287	56.9	13.8
18	7.8	265.4	78	25.6	298.7	13	55.4	286.2	288	58.7	14.8
19	7.2	265.9	79	26.1	299.3	14	57.2	287.2	289	60.5	15.8
+20	−6.7	266.5	+80	+26.7	299.8	+15	+59.0	288.2	290	+62.3	+16.8
21	6.1	267.0	81	27.2	300.4	16	60.8	289.2	291	64.1	17.8
22	5.6	267.6	82	27.8	300.9	17	62.6	290.2	292	65.9	18.8
23	5.0	268.2	83	28.3	301.5	18	64.4	291.2	293	67.7	19.8
24	4.4	268.7	84	28.9	302.0	19	66.2	292.2	294	69.5	20.8
+25	−3.9	269.3	+85	+29.4	302.6	+20	+68.0	293.2	295	+71.3	+21.8
26	3.3	269.8	86	30.0	303.2	21	69.8	294.2	296	73.1	22.8
27	2.8	270.4	87	30.6	303.7	22	71.6	295.2	297	74.9	23.8
28	2.2	270.9	88	31.1	304.3	23	73.4	296.2	298	76.7	24.8
29	1.7	271.5	89	31.7	304.8	24	75.2	297.2	299	78.5	25.8
+30	−1.1	272.0	+90	+32.2	305.4	+25	+77.0	298.2	300	+80.3	+26.8
31	0.6	272.6	91	32.8	305.9	26	78.8	299.2	301	82.1	27.8
32	0.0	273.2	92	33.3	306.5	27	80.6	300.2	302	83.9	28.8
33	+0.6	273.7	93	33.9	307.0	28	82.4	301.2	303	85.7	29.8
34	1.1	274.3	94	34.4	307.6	29	84.2	302.2	304	87.5	30.8
−35	1.7	274.8	+95	+35.0	308.2	+30	+86.0	303.2	305	+89.3	+31.8
36	2.2	275.4	96	35.6	308.7	31	87.8	304.2	306	91.1	32.8
37	2.8	275.9	97	36.1	309.3	32	89.6	305.2	307	92.9	33.8
38	3.3	276.5	98	36.7	309.8	33	91.4	306.2	308	94.7	34.8
39	3.9	277.0	99	37.2	310.4	34	93.2	307.2	309	96.5	35.8
+40	+4.4	277.6	+100	+37.8	310.9	+35	+95.0	308.2	310	+98.3	+36.8

Oct – Height of Waves After Sunrise

Inside	6	7	8	9	10	11	Tot	Avg
0-60	04	05	04	06	06	06	31/6	5.2
60-120	04	06	04	06	06	06	32/6	5.3
120-180	03	06	04	06	06	06	31/6	5.2
180-240	03	10	04	08	06	06	37/6	6.2
240-300	03	10	06	10	06	06	41/6	6.8
300-360	03	10	06	10	06	06	41/6	6.8
360-420	04	06	06	10	06	05	37/6	6.2
420-480	05	05	06	10	06	05	37/6	6.2
480-540	05	05	06	10	06	05	37.0/6	6.2
540-600	05	05	06	10	06	05	37.0/6	6.2
600-660	05	05	06	10	05	05	36.0/6	6.0
	44	173	58	96	65	61		

Outside	1	2	3	4	5	12	13	14	15	Tot	Avg
0-60		03	04	03	04	06	05	03	04	32/8	4.0
60-120		04	04	04	04	06	06	04	06	38/8	4.8
120-180		05	04	04	04	06	06	04	06	39/8	4.9
180-240		05	04	04	04	06	06	04	06	37/8	4.6
240-300		03	04	04	04	06	06	04	06	36/8	4.5
300-360		04	04	04	04	06	06	04	06	38.0/8	4.8
360-420		04	03	04	04	06	06	04	06	37/8	4.6
420-480		04	03	04	04	06	06	04	03	34/8	4.3
480-540		04	03	04	04	06	05	04	03	33/8	4.1
540-600		04	03	04	04	06	05	04	03	33/8	4.1
600-660		04	03	04	04	06				51.1/5	4.2/10
		124									

BEE 20x20 TO INCH



OCT - Windspeed
M. of Attack Sunrise

INSIDE	5 (0700)	6 (0700)	7 0700	8 0700	9 0700	10 0700	11 0700	TOT	AVG
0-60	8.0	10.5	20.0	16.0	17.0	19.0	15.0	105.5/7	15.1
60-120	6.5	10.0	20.0	16.5	17.5	16.5	17.0	104.0/7	14.9
120-180	14.0	13.0	20.0	17.5	20.0	20.0	17.5	122.0/7	17.4
180-240	11.0	10.5	17.5	22.5	20.0	21.5	16.5	119.5/7	17.1
240-300	13.0	10.0	19.5	23.0	17.0	23.5	18.5	124.5/7	17.8
300-360	13.5	8.5	17.0	20.0	20.0	21.0	20.5	120.5/7	17.2
360-420	11.5	8.0	19.5	19.0	17.0	23.5	17.0	115.5/7	16.5
420-480	11.0	8.0	16.5	17.5	19.0	25.0	20.0	117.0/7	16.7
480-540	11.5	5.0	22.0	18.5	16.5	22.0	17.0	112.5/7	16.1
540-600	10.5	5.0	21.5	16.0	17.0	20.0	15.5	105.5/7	15.1
600-660	10.5	5.0	15.0	16.0	18.0	15.0	20.0	101.5/7	14.5

OUTSIDE	2	3 (0700)	4 (0700)	12 (0700)	13 0700	14 0700	15 0700	TOT	AVG
0-60	25.0	12.5	15.5	20.0	16.5	14.0	14.5	118.0/7	16.9
60-120	24.0	15.0	12.0	20.0	17.0	14.0	15.5	117.5/7	16.8
120-180	20.0	15.0	16.0	19.0	20.0	15.0	15.0	120.0/7	17.1
180-240	23.5	14.0	15.0	16.0	15.0	14.0	15.0	112.5/7	16.1
240-300	21.0	14.5	17.0	22.0	15.0	14.0	13.0	116.5/7	16.6
300-360	14.0	14.0	16.0	18.0	15.0	14.0	14.0	105.0/7	15.0
360-420	19.5	10.0	15.0	16.5	15.0	15.0	14.0	105.0/7	15.0
420-480	14.0	14.0	15.5	15.5	15.0	15.0	11.0	100.0/7	14.3
480-540	12.0	10.5	17.5	13.0	13.0	12.0	11.5	89.5/7	12.8
540-600	14.0	14.0	13.0	14.5	14.0	13.0	13.0	91.5/7	13.1
600-660	14.5	14.5	14.5	14.5	14.0	14.0	14.0	97.0/7	13.9

Oct - Temp - Min After Sunrise

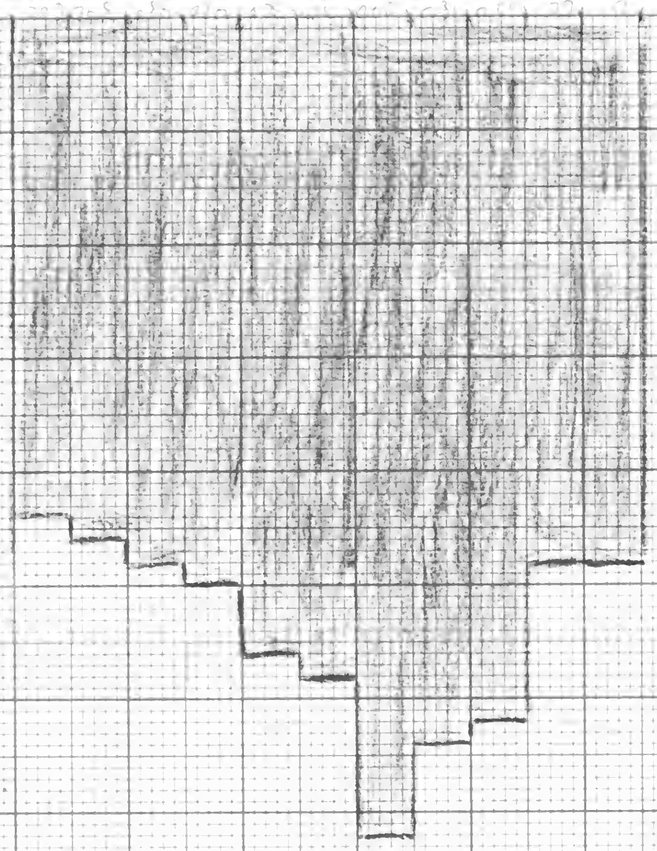
INSIDE

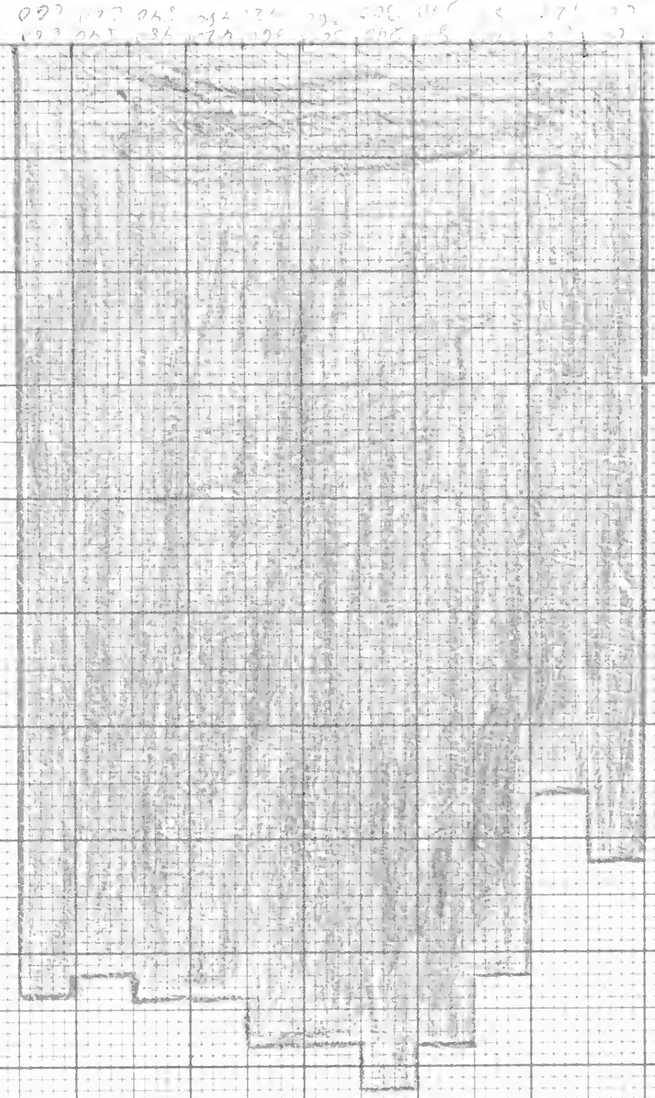
	5 0700	6 0700	7 0700	8 0700	9 (0700)	10 0700	11 0700	Total	Avg
0-60	81.2	81.0	81.2	82.2	82.5	81.3	81.5	570.9 / 7	81.6
60-120	80.9	81.3	82.0	81.2	81.2	81.5	81.2	569.3 / 7	81.3
120-180	81.6	82.5	83.1	82.5	81.8	82.0	81.0	574.5 / 7	82.1
180-240	82.0	82.0	82.3	82.5	82.9	83.0	82.0	576.7 / 7	82.4
240-300	82.2	81.8	83.5	83.0	82.9	82.5	82.2	578.1 / 7	82.6
300-360	82.4	82.5	82.3	83.2	83.5	82.0	81.2	577.1 / 7	82.4
360-420	81.9	82.5	82.8	82.3	83.2	82.5	81.9	577.1 / 7	82.4
420-480	81.8	82.8	82.0	82.8	82.1	81.8	81.8	575.1 / 7	82.2
480-540	82.3	83.5	82.2	82.2	81.8	81.2	82.5	575.7 / 7	82.2
540-600	82.2	83.4	82.0	81.8	82.2	81.5	81.5	574.6 / 7	82.1
600-660	82.2	83.4	81.8	82.0	81.8	82.8	81.1	575.1 / 7	82.2

OUTSIDE

	2	3 0700	4 (0700)	12 (0700)	13 0700	14 (0700)	15 0700	Total	Avg
0-60	79.9	79.9	80.2	81.0	81.0	79.5	81.0	562.5 / 7	80.4
60-120	80.1	80.0	80.8	80.8	80.7	79.5	81.0	562.9 / 7	80.4
120-180	80.9	81.5	80.4	81.1	82.8	81.0	79.9	567.6 / 7	81.1
180-240	78.0	81.8	81.8	81.5	81.8	83.1	80.5	568.5 / 7	81.2
240-300	80.3	81.8	82.0	82.4	82.1	82.0	80.4	571.0 / 7	81.6
300-360	78.5	82.0	82.0	81.9	81.4	79.5	80.9	566.2 / 7	80.9
360-420	80.4	81.2	81.7	81.8	81.6	78.3	80.5	565.5 / 7	80.8
420-480	78.9	81.2	81.8	81.5	81.5	77.2	79.1	563.2 / 7	80.5
480-540	80.0	80.5	82.0	81.2	81.8	75.4	80.2	563.1 / 7	80.4
540-600	78.2	80.5	81.2	81.6	81.6	77.3	79.5	562.2 / 7	80.3
600-660	79.7	81.4	79.8	81.0	80.9	79.8	79.0	561.7 / 7	80.2

BEE 20x20 TO INCH



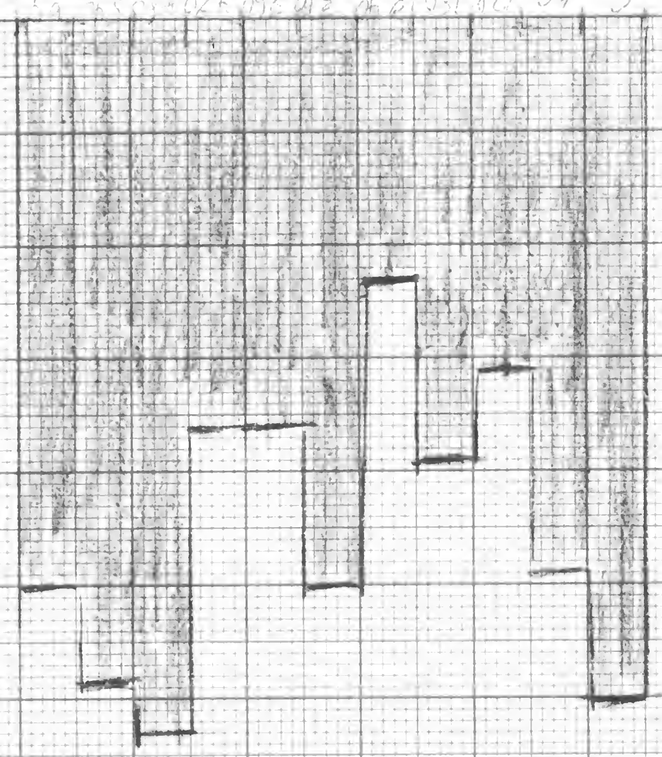


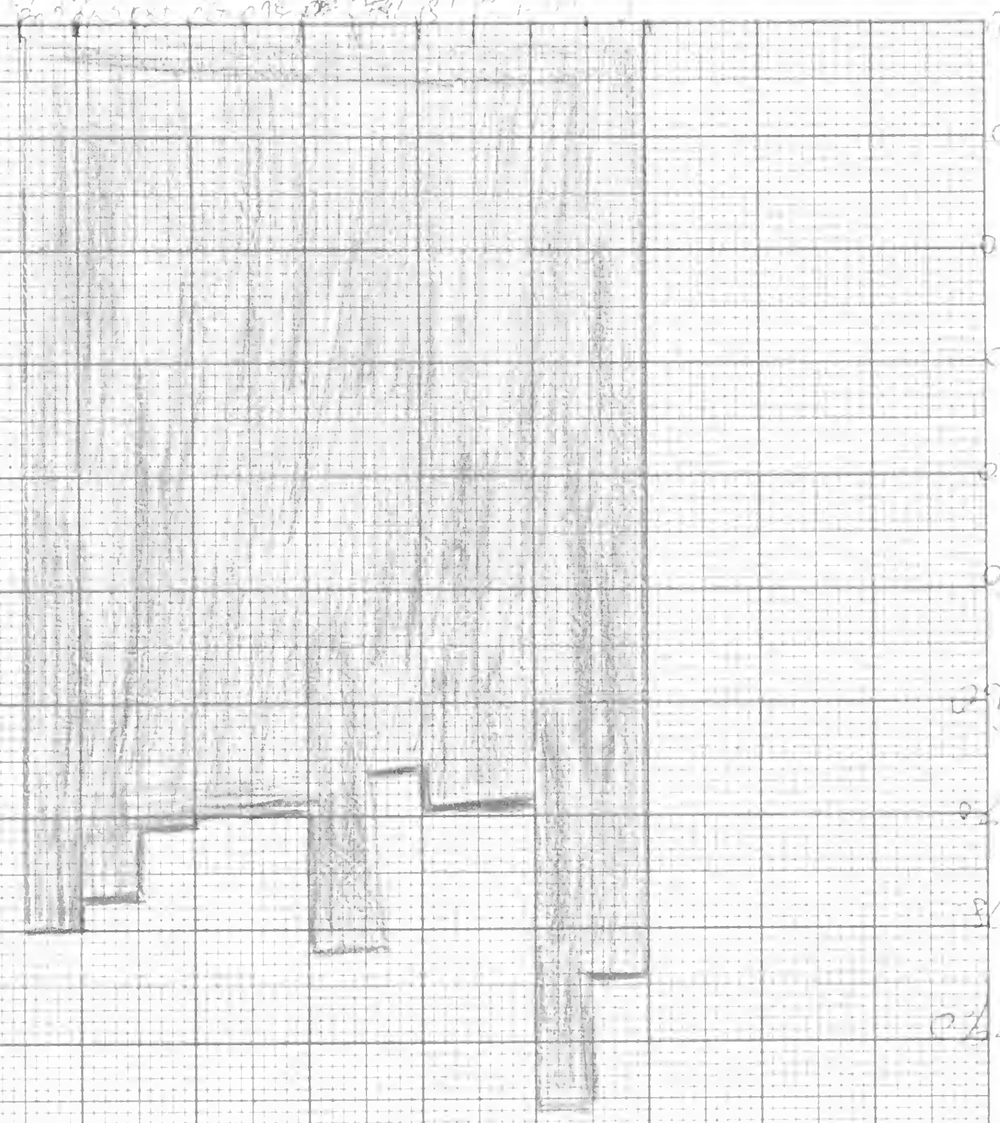
Oct - Huzzi Min after Sunrise

INSIDE	5 (0700)	6 (0700)	7 0700	8 0700	9 0700	10 0700	11 0700	TOT	AVG
0-60	78	82	78	75	77	81	78	549/7	78.4
60-120	82	81	75	78	79	81	81	557/7	79.6
120-180	81	80	72	74	69	79	83	538/7	76.9
180-240	79	80	78	77	68	78	78	538/7	76.9
240-300	75	82	71	78	72	79	80	536/7	76.6
300-360	77	85	75	75	73	82	81	548/7	78.3
360-420	77	85	74	74	75	77	77	539/7	77.0
420-480	79	78	74	74	79	79	76	539/7	77.0
480-540	78	77	75	75	77	82	76	540/7	77.1
540-600	79	79	76	76	73	83	78	544/7	77.7
600-660	78	79	77	75	80	81	76	546/7	78.0

OUTSIDE	2	3 (0700)	4 (0700)	12 0700	13 0700	14 0700	15 0700	TOT	AVG
0-60	77	74	76	83	77	73	72	532/7	76.0
60-120	75	73	77	77	75	76	71	524/7	74.9
120-180	69	71	78	77	71	72	74	512/7	73.1
180-240	77	72	74	73	76	64	71	517/7	73.9
240-300	79	72	74	72	72	68	69	506/7	72.3
300-360	84	69	76	73	73	83	67	525/7	75.0
360-420	77	70	75	72	73	82	66	515/7	73.6
420-480	70	74	73	73	72	83	70	515/7	73.6
480-540	72	74	75	78	73	93	69	534/7	76.3
540-600	78	79	76	78	69	86	65	531/7	75.9
600-660	75	73	78	79	69	78	73	525/7	75.0

BEE 20x20 TO INCH





1963

Locality

Date	Dist. from Oahu 1200	Dist. from Oahu 2400	Dist. from Johnston 1200	Dist. from Johnston 2400	Time S/R	Time SS	Miles Traveled SR-SS	Miles Traveled Darkness
Oct 1	10 S	125 WSW	724 ENE	599 ENE				
Oct 2	223 WSW	267 WSW	501 ENE	457 ENE				
Oct 3	398 WSW	490 WSW	326 ENE	234 ENE				
Oct 4	649 WSW	726 WSW	76 ENE	26 S				
Oct 5	749 WSW	869 WSW	131 SSE	224 S				
Oct 6	950 WSW	864 WSW	292 SSW	185 SSW				
Oct 7	769 WSW	846 WSW	102 S	138 SW				
Oct 8	962 WSW	932 WSW	260 SW	214 SW				
Oct 9	857 WSW	806 WSW	132 WSW	81 W				
Oct 10	945 WSW	1000 WSW	321 WSW	277 WSW				
Oct 11	895 WSW	794 WSW	177 W	76 W				
Oct 12	728 WSW	623 WSW	5 NNW	101 ENE				
Oct 13	505 WSW	410 WSW	219 ENE	314 ENE				
Oct 14	307 WSW	226 WSW	417 ENE	498 ENE				
Oct 15	124 WSW	---	600 ENE	---				

Percentage Distribution of Shearwater-Petrel Sightings inside and outside Study Area - October as compared to entire Sept.-Oct. Period

Inside =
Outside =

Percentage of Sightings

Avg Wind Speed (Beaufort)

BEE 20×20 TO INCH

01 October 1963

21.16	157.56	RWU E15 BKN 35 BKN 800 VC	8	1017.7	80.1	73.2	70.3	72	1.0	1.0	115 02 06	83.0	15.0	110	210	10.0
21.09	158.02	E20 BKN 30 BKN	8	1016.5	80.1	74.3	71.9	76	.9	.9	070 03 05	83.0	13.0	055	210	10.0
21.02	158.08	RWU 20 SCT E 30 BKN	8	1016.0	81.1	73.8	70.8	71	.7	.7	080 03 10	83.0	15.5	074	250	10.0
21.00	158.20	20 SCT E 30 BKN	8	1015.6	79.5	74.0	71.7	77	.6	.6	080 03 11	83.0	18.0	070	255	10.0
20.56	158.29	20SCT 30SCT	8	1014.9	80.1	73.3	71.2	74	.3	.3	070 04 12	83.0	16.5	074	246	10.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20.44	158.55	20SCT 30SCT	8	1014.7	79.0	74.3	72.3	83	.3	.3	080 04 12	83.0	12.0	077	247	10.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	83.0	17.0	065	244	10.0
20.33	159.25	20 SCT	8	1014.8	81.0	78.[illegible]	76.9	88	.3	.3	070 03 12	83.0	17.0	065	246	10.0
20.29	159.35	20 SCT	8	1014.8	[illegible]	79.0	76.0	74.9	.3	.3	070 03 12	83.0	18.0	065	246	10.0
20.25	159.43	20 SCT	8	1014.8	77.0	74.0	72.9	87	.3	.3	070 03 12	83.0	20.0	065	246	10.0
20.22	159.54	20 SCT	8	1014.8	75.0	72.0	70.7	85	.3	.3	070 03 12	83.0	22.0	065	246	10.0

02 October 1963

20.18	160.03	E 20 BKN	8	1014.5	81.0	76.0	74.1	79	.6	.6	060 03 12	83.0	20.	060	246	10.0
20.14	160.13	E 20 BKN	8	1014.9	80.2	76.0	72.9	76	.6	.6	060 03 12	83.0	20.0	065	247	10.0
20.11	160.35	E 20 BKN	8	1014.2	81.0	76.0	74.1	79	.6	.6	070 03 12	83.0	21.0	070	246	10.0
20.09	160.41	E 20 BKN	8	1014.2	81.0	76.0	74.1	79	.6	.6	070 03 12	83.0	23.0	075	246	10.0
20.04	160.50	E 20 BKN	8	1014.2	81.0	76.0	74.1	79	.6	.6	080 03 12	83.0	24.0	085	246	10.0
20.00	161.00	20SCT90SCT	8	1013.9	79.9	74 .2	71.9	77	.5	.5	080 03 12	83.0	25.0	090	246	10.0
19.56	161.09	20 SCT 80 SCT U BKN	8	1014.1	80.1	74.0	71.5	75	.6	.6	080 03 12	83.0	24.0	098	247	10.0
19.55	161.08	15SCT20Sct 80 SCT U BKN	8	1014.7	80.9	73.0	69.7	69	.6	.6	090 04 12	83.0	20.0	111	247	10.0
19.48	161.15	R/U E20BKN 80 BKN	5	1015.7	78.0	75.0	73.8	87	.8	.8	090 05 12	83.0	23.5	091	247	10.0
19.46	161.25	R/U E20 BKN 80 OVC	5	1015.9	80.3	75.3	73.3	79	1.0	1.0	090 05 12	83.0	21.0	084	247	10.0
19.42	161.33	R/U E 20 BKN 80 OVC	5	1015.5	78.5	74.8	73.3	84	1.0	1.0	080 03 12	83.0	14.0	102	247	10.0
19.40	161.42	R/U E20 BKN 80 BKN	6	1015.2	80.4	74.8	72.6	77	.7	.7	080 04 10	83.0	19.5	103	247	10.0
19.37	161.51	R/U E20BKN 80BKN U BKN	7	1014.2	80.9	73.4	70.2	70	.8	.8	080 04 10	83.0	14.0	107	411	Stop
19.33	161.59	20 SCT 80 BKN U BKN	8	1014.0	82.0	75.0	72.2	72	.7	.7	080 04 10	83.0	12.0	082	247	10.0
19.30	162.08	R/U E20 BKN 80 BKN	4	1013.5	80.2	74.8	72.7	78	.8	.8	080 04 10	82.0	14.0	092	247	10.0
19.27	162.17	R/U E20 BKN 80BKN U BKN	7	1013.2	79.9	73.9	71.4	75	.7	.7	080 04 10	83.0	14.5	083	247	10.0
19.23	162.20	R/U 20 SCT 80 SCT U BKN	8	1013.1	80.1	74.5	72.3	77	.6	.6	100 04 13	83.0	15.5	096	247	10.0
19.22	162.29	20 SCT E 80 BKN U BKN	8	1013.4	80.0	73.2	70.9	74	.7	.7	095 04 10	83.0	14.5	089	247	10.0
19.20	162.40	20 SCT E 80 BKN U BKN	8	1013.8	80.1	74.0	71.5	75	.7	.7	090 04 10	84.0	14.0	090	247	10.0
19.16	162.50	R/U 20 SCT E 80 BKN	8	1013.9	80.0	73.2	70.3	72	.6	.6	090 04 10	84.0	14.0	093	247	10.0
19.12	163.01	15 SCT	8	1014.4	80.2	73.2	70.3	72	.4	.4	100 03 10	84.0	15.0	090	247	10.0
19.03	163.11	14 SCT	8	1014.3	80.5	73.3	70.3	71	.5	.5	100 03 10	84.0	15.0	090	247	10.0
19.03	163.21	15 SCT	8	1014.5	80.5	73.6	70.7	72	.5	.5	100 03 10	84.0	15.0	090	247	10.0
18.58	163.31	18 SCT	8	1014.3	80.7	73.8	70.3	72	.4	.4	100 03 10	84.0	15.0	090	247	10.0

03 October 1963

18.54	163.42	20SCT 80 SCT	8	1014.4	80.0	73.0	70.0	71	.4	.4	095 03 07	84.0	14.5	095	247	10.0
18.53	163.45	15 SCT 20SCT 80 SCT / SCT	8	1013.8	79.9	73.5	70.8	74	.5	.4	095 03 07	84.0	14.0	100	247	10.0
18.50	163.53	E 20 BKN	8	1013.0	81.0	73.0	69.6	68	.6	.6	090 03 07	84.0	14.0	097	247	10.0
18.46	164.03	E 20 BKN	8	1012.3	81.0	73.0	69.6	68	.6	.6	090 03 07	84.0	14.5	096	247	10.0
18.44	164.09	E 20 BKN	8	1012.3	80.0	72.5	69.3	70	.6	.6	085 04 08	84.0	15.0	095	247	10.0
18.38	164.10	20 SCT E 100 BKN U BKN	8	1012.4	80.0	72.8	69.7	71	.7	.7	080 04 10	84.0	16.5	097	246	10.0
18.36	164.15	30 SCT E 150 BKN	8	1012.6	79.9	73.4	70.7	74	.6	.6	090 04 07	84.0	12.5	082	All	Stop
18.33	164.18	30 SCT 150SCT	8	1013.1	80.0	73.5	70.5	73	.3	.3	080 04 11	84.0	15.0	100	246	10.0
18.31	164.28	30SCT 150 SCT	8	1014.1	81.5	74.2	71.2	71	.4	.4	080 04 10	84.0	15.0	097	246	10.0
18.28	164.36	30SCT 150SCT	8	1014.4	81.8	74.8	72.0	72	.3	.3	080 04 10	84.0	14.0	088	247	10.0
18.23	164.46	30SCT 150SCT	8	1014.4	81.8	74.8	72.0	72	.4	.4	090 04 12	84.0	14.5	093	247	10.0
18.21	164.55	30SCT 150SCT	8	1014.0	82.0	74.2	71.0	69	.3	.3	090 04 12	84.0	14.0	088	247	10.0
18.17	165.05	30SCT150SCT U BKN	8	1013.2	81.2	73.7	70.5	70	.7	.7	090 03 08	84.0	10.0	080	247	10.0
18.15	165.09	30 SCT 150 SCT / SCT	8	1012.8	81.2	74.5	71.8	74	.5	.4	090 03 08	84.0	14.0	097	247	10.0
18.16	165.11	30SCT / SCT	8	1011.9	80.5	74.8	71.5	74	.5	.3	090 03 10	84.0	10.5	133	247	10.0
18.12	165.18	30 SCT 150 SCT / SCT	8	1011.4	80.5 ✓	75.5	73.6	79 ✓	.5	.4	090 03 15	84.0	14.0 ✓	092	247	10.0
18.09	165.27	30 SCT 150 SCT /- OVC	8	1011.5	81.4 ✓	74.8	72.2	73	1.0	.2	090 03 13	84.0	14.5	099	247	10.0
18.08	165.37	30SCT /- OVC	8	1011.9	80.9	74.2	71.5	73	1.0	.2	090 04 12	84.0	12.0	096	247	10.0
18.07	165.48	30 SCT 150 SCT /- BKN	8	1012.0	80.5	74.0	71.3	73	.8	.3	100 04 12	84.0	11.0	095	247	10.0
18.03	165.56	30SCT /-BKN	8	1011.6	80.4	74.8	72.6	77	.8	.4	100 04 12	86.0	12.0	096	247	10.0
17.56	166.06	20 SCT	8	1011.7	80.0	74.0	71.6	76	.5	.5	100 04 12	86.0	13.0	095	245	10.0
17.53	166.15	20 SCT	8	1013.0	80.0	76.0	74.5	83	.5	.5	100 04 12	86.0	13.5	097	245	10.0
17.48	166.25	20 SCT	8	1013.0	80.0	76.0	74.5	83	.5	.5	100 04 12	86.0	14.0	096	245	10.0
17.44	166.33	20 SCT	8	1013.0	81.0	76.0	74.5	83	.5	.5	100 04 12	86.0	14.5	096	235	10.0

04 October 1963

17.40	166.43	E 30 BKN M U 30 SCT	8	1012.7	80.0	74.0	71.6	76	.6	.6	100 04 13	86.0	15.0	096	245	10.0
17.36	166.53	/- OVC	8	1012.5	80.0	74.5	72.3	77	1.0	.4	100 04 13	86.0	15.5	096	245	10.0
17.33	167.03	E 30 BKN	8	1011.7	80.0	75.0	73.0	79	.6	.6	100 04 13	86.0	15.5	098	245	10.0
17.29	167.11	E30BKN U BKN	8	1011.7	80.0	75.0	73.0	79	.7	.6	100 04 13	86.0	15.5	099	245	10.0
17.25	167.20	E30BKN U BKN	8	1011.7	81.0	75.0	72.6	76	.7	.6	100 04 13	86.0	15.0	102	245	10.0
17.21	167.28	E30BKN U BKN	8	1011.1	81.0	76.0	74.1	79	.7	.5	100 04 15	86.0	15.5	106	245	10.0
17.17	167.34	30 SCT 120 SCT U OVC	8	1011.1	80.2	74.5	72.2	76	1.0	.6	100 03 15	86.0	15.5	108	245	10.0
17.16	167.42	30SCT 120 SCT U - OVC	8	1011.9	80.8	75.2	73.0	77	1.0	.4	100 04 15	86.0	12.0	087	All	Stop
17.17	167.51	30 SCT 120 SCT U - OVC	8	1012.9	80.4	75.0	72.9	78	1.0	.4	100 04 15	86.0	16.0	101	250	10.0
17.13	168.01	30 SCT 120 SCT U - OVC	8	1011.3	81.8	75.2	72.6	74	1.0	.4	110 04 10	86.0	15.0	105	250	10.0
17.10	168.10	30 SCT 120 SCT U - OVC	8	1013.1	82.0	75.5	73.0	74	.9	.3	110 04 10	86.0	17.0	109	250	10.0
17.08	168.20	30 SCT 120 SCT U - OVC	8	1013.1	82.0	76.0	73.7	76	1.0	.5	110 04 10	86.0	16.0	107	250	10.0
17.03	168.29	30SCT U-OVC	8	1011.9	81.7	75.5	73.1	75	1.0	.4	110 04 15	86.0	15.0	117	250	10.0
17.00	168.40	30 SCT 120 SCT U - OVC	8	1011.5	81.8	75.9	72.5	73	1.0	.4	110 04 15	86.0	15.5	102	250	10.0
16.58	168.48	30 SCT 120 SCT U BKN	8	1010.7	82.0	75.8	73.4	75	.7	.4	110 04 15	86.0	17.5	104	250	10.0
16.55	168.02	30 SCT 120 SCT U BKN	8	1010.5	81.2	75.4	73.1	76	.8	.5	105 04 13	86.0	13.0	109	250	10.0
16.52	169.09	M U 120 BKN 120BKN U OVC	8	1010.7	79.8	74.6	72.5	78	1.0	.8	105 04 13	86.0	14.5	092	250	10.0
16.48	169.15	30 SCT E 100 BKN U OVC	8	1010.7	82.0	75.8	73.4	75	1.0	.6	105 04 13	86.0	10.0	099	250	10.0
16.46	169.18	30 SCT 120 SCT U - OVC	8	1010.7	81.1	75.1	72.9	76	1.0	.5	105 04 13	86.0	12.5	099	235	10.0
16.43	169.28	30 SCT 120 SCT / SCT	8	1011.0	80.6	76.0	73.9	80.0	.5	.3	105 04 13	86.0	12.5	097	220	10.0
16.35	169.27	L 20 BKN	8	1011.7	80.0	77.0	77.3	91	.6	.6	100 04 13	86.0	12.5	100	220	10.0
16.25	169.23	L 20 BKN	8	1011.7	80.0	78.0	77.3	91	.6	.6	100 04 13	86.0	12.5	105	163	10.0
16.15	169.21	E 20 BKN	8	1012.0	80.0	78.0	77.3	91	.6	.6	100 04 13	86.0	11.0	100	163	10.0
16.07	169.17	E 20 BKN	8	1012.3	80.0	78.0	77.3	91	.6	.6	100 04 13	86.0	11.5	100	163	10.0

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	LONG																
	15.56	169.15	E 30 BKN	8	1011.3	81.0	76.0	74.1	79	.6	.6	110 04 07	85.0	10.0	112	163	10.0
	15.47	169.12	W U 30 SCT 100SCT U-BKN	8	1010.4	80.4	75.9	74.2	82	.8	.4	110 04 07	85.0	9.0	122	165	10.0
	15.37	169.09	E 30 BKN	8	1009.4	80.0	76.0	74.5	83	.6	.6	110 04 07	85 .0	9.0	120	163	10.0
	15.28	169.05	E 30 BKN	8	1009.0	79.0	75.0	73.4	83	.6	.6	110 04 07	85.0	9.0	120	163	10.0
	15.18	169.03	E 30 BKN	8	1009.0	79.0	74.0	72.0	79	.6	.6	110 04 07	85.0	10.0	113	163	10.0
	15.15	169.02	E 30 BKN	8	1010.3	80.0	75.0	73.0	79	.6	.6	110 04 07	85.0	11.0	115	163	10.0
	15.09	169.00	W- 20 SCT E150BKN UBKN	8	1010.2	81.2	75.8	73.7	78	.8	.5	110 04 08	85.0	8.0	067	163	10.0
	[illegible]	[illegible]	WU 20 SCT E150BKN UBKN	8	1010.6	80.9	76.4	74.7	82	.7	.6	110 04 07	85.0	6.5	050	163	10.0
	14.54	168.55	30 SCT 150 SCT / SCT	8	1010.9	81.6	76.8	75.0	81	.5	.4	110 04 07	85.0	7.0	064	163	10.0
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	45	[illegible]	[illegible]	[illegible]	1011.5	82.2	76.0	73.6	75	.8	.4	110 04 07	85.0	13.0	067	163	10.0
	14.39	168.51	30 SCT 120 SCT / SCT	8	1011.0	82.4	76.8	74.7	77	.3	.2	110 04 07	85.0	13.5	054	163	10.0
	14.31	168.49	30 SCT 120SCT / SCT	8	1010.4	81.9	76.2	74.0	77	.3	.3	100 04 08	85.0	11.5	068	225	10.0
	14.20	168.56	30 SCT 120 SCT U-BKN	8	1010.0	81.8	76.5	74.5	79	.6	.2	100 04 08	85.0	11.0	073	225	10.0
	14.13	168.66	30 SCT 120 SCT U-BKN	8	1009.5	82 .3	76.9	74.9	78	.6	.2	090 04 12	85.0	11.5	071	225	10.0
	14.07	169.15	30 SCT 120 SCT /- SCT	8	1009.1	82.2	77.1	75.2	79	.5	.2	090 04 12	86.0	10.5	061	225	10.0
	14.00	169.25	30 SCT 120 SCT / SCT	8	1009.5	82.2	76.8	74.8	78	.7	.4	090 04 12	86.0	10.5	064	223	10.0
	13.51	169.31	20 SCT E 120 BKN	8	1010.0	83.0	77.0	74.8	76	.7	.7	090 04 10	86.0	10.5	065	223	10.0
	13.43	169.38	E30BKN120BKN	8	1010.5	82.2	77.5	75.8	81	.8	.8	090 04 10	86.0	10.0	058	223	10.0
	13.40	169.36	30SCTE120BKN	8	1011.1	83.0	77.8	76.3	80	.6	.6	090 04 10	86.0	10.5	059	223	10.0
	13.30	169.46	30SCTE120BKN	8	1011.3	83.0	77.0	74.8	76	.6	.6	090 04 10	86.0	10.0	060	223	10.0
	13.23	169.53	30SCTE120BKN	8	1010.9	83.0	77.8	76.3	80	.6	.6	090 04 10	86.0	10.0	059	225	10 .0
	13.16	170 .01	30SCTE120BKN	8	1010.9	83.0	77.8	76.3	80	.6	.6	090 04 10	86.0	10.0	057	225	10.0
	13.09	170.08	30SCT#120BKN	8	1011.0	83.0	77.8	76.3	80	.6	.6	090 04 10	86.0	10.0	061	225	10.0

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13.02	170.15	30SCT120SCT	8	1010.0	81.2	75.8	73.7	78	.4	.4	090 04 10	86.0	6.5	051	225	10.0
12.55	170.23	30SCT120SCT	8	1010.1	81.1	76.9	75.3	82	.4	.4	090 04 10	86.0	6.0	053	225	10.0
12.48	170.30	30SCT120SCT	8	1010.3	81.0	76.0	74.1	79	.5	.5	090 04 10	86.0	7.0	059	225	10.0
12.40	170.37	30SCT120SCT	8	1010.0	81.9	76.2	74.0	77	.4	.4	090 04 10	86.0	7.0	060	225	10.0
12.33	170.45	30SCT120SCT	8	1009.9	81.8	76.5	74.5	79	.4	.4	090 04 12	86.0	8.0	067	225	10.0
12.26	170.52	30SCT120SCT	8	1009.5	81.6	76.8	75.0	81	.5	.5	090 04 12	86.0	10.0	068	225	10.0
12.19	171.00	30SCT 120SCT / SCT	8	1009.6	81.0	76.8	75.2	82	.5	.4	090 04 13	86.0	10.5	071	225	10.0
12.16	171.09	30SCT129SCT	8	1010.3	81.3	76.7	75.0	81	.5	.5	090 04 13	86.0	10.0	053	All	Stop
12.10	171.14	30 SCT 120 SCT U- OVC	8	1010.9	82.5	77.5	75.7	80	1.0	.4	080 03 10	86.0	13.0	084	315	10.0
12.16	171.21	30 SCT 120 SCT U- OVC	8	1011.2	82.0	77.0	75.1	80	1.0	.3	080 03 10	86.0	10.5	070	315	10.0
12.22	171.27	30 SCT 120 SCT U- OVC	8	1011.5	81.8	77.5	75.9	82	1.0	.2	080 03 10	86.0	10.0	077	315	10.0
12.29	171.33	30SCT U-OVC	8	1011.3	82.5	77.5	75.7	85	.8	.2	080 03 10	86.0	8.5	070	315	10.0
12.36	171.40	30SCT U-OVC	8	1010.4	82.5	77.5	75.7	85	1.0	.4	080 04 10	86.0	8.0	080	315	10.0
12.39	171.45	30 SCT 120 SCT U- OVC	8	1009.9	82.8	77.4	75.4	78	1.0	.5	080 05 10	86.0	8.0	089	315	10.0
12.47	171.43	30 SCT 120 SCT U- OVC	8	1009.1	83.5	77.8	75.7	77	1.0	.4	080 05 10	86.0	5.0	045	045	10.0
12.51	171.39	RW- 30 SCT E120BKNUBKN	5	1009.0	83.4	78.2	76.3	79	1.0	.6	080 05 10	86.0	5.0	045	045	10.0
12.57	171.32	RWU 30 SCT E120BKNUOVC	8	1009.0	83.4	78.2	76.3	79	1.0	.6	080 05 10	86.0	5.0	045	045	10.0
13.04	171.26	30 SCT 120 SCT U- OVC	8	1009.6	82.4	77.8	75.8	81	1.0	.5	080 05 10	86.0	13.0	070	045	10.0
13.10	171.19	30SCT U-OVC	8	1010.2	82.3	78.0	76.4	82	1.0	.5	080 05 10	86.0	10.5	073	045	10.0
13.19	171.12	30SCT U-OVC	8	1010.6	82.3	77.5	75.8	81	1.0	.4	080 05 10	86.0	13.0	072	045	10.0
13.25	171.05	30SCT U-OVC	8	1010.8	82.8	77.4	75.4	78	1.0	.4	080 05 10	86.0	13.5	074	045	10.0
13.32	170.57	30SCT U-OVC	8	1010.9	82.5	77.5	75.7	85	1.0	.5	080 05 10	86.0	14.0	076	045	10.0
13.39	170.51	30SCT U-OVC	8	1011.1	81.8	77.5	75.9	82	1.0	.4	080 05 10	86.0	14.5	080	045	10.0
13.45	170.44	30SCT U-OVC	8	1011.4	81.8	76.5	74.5	79	1.0	.4	080 05 10	86.0	15.0	085	045	10.0

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13.52	170.36	30SCT U-OVC RWU	8	1011.7	81.3	75.9	73.8	78	1.0	.5	080 05 10	86.0	15.0	084	045	10.0
13.59	170.30	30SCT U-OVC	8	1011.8	81.3	76.8	74.7	81	1.0	.4	080 05 10	86.0	15.0	086	045	10.0
14.06	170.23	30SCT U BKN	8	1011.9	81.8	76.0	73.8	77	.7	.2	080 05 10	86.0	16.0	079	045	10.0
14.13	170.16	30SCT U BKN	8	1011.8	81.9	76.2	74.0	77	.8	.3	080 05 10	86.0	18.0	083	045	10.0
14.19	170.09	HAZE 30 SCT	7	1011.8	81.1	76.9	75.3	82	.3	.3	080 05 10	86.0	20.0	067	045	10.0
14.26	170.02	HAZE 30 SCT	6	1011.7	81.2	75.8	73.7	78	.3	.3	080 05 10	86.0	20.0	060	045	10.0
14.26	170.02	HAZE 30 SCT	5	1011.7	81.2	75.7	73.7	78	.4	.4	080 05 10	86.0	20.0	058	045	10.0
14.48	170.13	HAZE 30 SCT	5	1012.0	82.0	75.7	73.2	75	.5	.5	090 06 11	86.0	20.0	067	All	Stop
14.53	169.50	HAZE 30 SCT	3	1012.6	83.1	75.9	73.1	72	.5	.5	090 06 11	86.0	20.0	080	065	10.0
14.56	169.44	HAZE 30 SCT	2	1013.3	82.3	76.8	74.7	78	.5	.5	090 10 06	86.0	17.5	072	065	10.0
14.59	169.37	HAZE 30 SCT	3	1013.1	83.5	75.8	73.2	71	.4	.4	090 10 06	86.0	19.5	072	065	10.0
15.03	169.31	HAZE 30 SCT	5	1012.9	82.3	75.9	73.4	75	.4	.4	090 10 06	86.0	17.0	072	065	10.0
15.09	169.32	HAZE 30 SCT	4	1012.4	82.8	76.2	73.7	74	.3	.3	080 06 10	86.0	19.5	091	315	10.0
15.15	169.33	HAZE 30 SCT	6	1011.6	82.0	75.5	73.0	74	.3	.3	080 05 10	86.0	16.5	095	315	10.0
15.29	169.50	HAZE 30 SCT	5	1011.2	82.2	76.0	73.7	75	.4	.4	080 05 10	86.0	22.0	089	315	10.0
15.37	169.55	HAZE 30 SCT	5	1011.0	82.0	76.1	73.8	76	.5	.5	080 05 10	86.0	21.5	083	315	10.0
15.39	169.57	HAZE 30 SCT	7	1011.0	81.8	76.0	73.8	77	.5	.5	080 05 10	86.0	15.0	058	225	10.0
15.31	170.07	HAZE E30BKN	7	1011.4	83.5	76.6	74.0	73	.6	.6	080 05 10	86.0	14.0	068	225	10.0
15.23	170.18	HAZE 30 SCT	6	1011.9	81.8	76.0	73.8	77	.5	.5	080 05 10	86.0	15.5	065	225	10.0
15.15	170.25	HAZE E30SCT	4	1012.3	82.0	77.0	75.2	80	.6	.6	080 05 10	86.0	18.0	069	225	10.0
15.06	170.34	HAZE 30 SCT	5	1012.3	82.0	76.1	73.8	76	.5	.5	080 05 10	86.0	18.0	070	225	10.0
14.57	170.43	HAZE 30 SCT	5	1012.4	82.2	76.0	73.7	75	.5	.5	080 05 10	86.0	17.0	069	225	10.0
14.50	170.52	HAZE 30 SCT	5	1012.0	82.3	75.9	73.4	75	.5	.5	080 05 10	86.0	17.5	072	225	10.0
14.41	171.00	HAZE 30 SCT	5	1012.1	81.3	75.9	73.8	78	.5	.5	080 05 10	86.0	17.0	073	225	10.0

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14.32	171.09	HAZE E30BKN	5	1012.3	81.2	75.8	73.7	78	.6	.6	080 04 10	86.0	16.0	068	225	10.0
14.24	171.18	HAZE E30BKN	5	1012.4	81.4	76.0	73.9	78	.6	.6	080 04 10	86.0	16.0	070	225	10.0
14.16	171.26	HAZE E30BKN	5	1012.2	81.8	76.0	73.8	77	.6	.6	080 04 10	86.0	17.0	072	225	10.0
14.09	171.34	HAZE E30BKN	5	1012.1	81.3	75.9	73.8	78	.6	.6	080 04 10	86.0	16.5	072	225	10.0
14.03	171.42	HAZE E30BKN	5	1012.0	81.2	75.8	73.7	78	.6	.6	080 04 10	86.0	16.5	070	All	Stop
14.02	171.44	HAZE E30BKN	5	1011.9	81.9	76.2	74.0	77	.6	.6	080 04 10	86.0	17.0	068	All	Stop
14.02	171.47	HAZE E30BKN	5	1011.6	82.2	76.0	73.7	75	.6	.6	080 04 10	86.0	16.0	064	ALL	STOP
14.01	171.55	HAZE U BKN 30SCT100SCT	5	1011.7	81.2	75.8	73.7	78	.6	.5	090 04 08	86.0	16.5	060	ALL	STOP
13.50	171.57	HAZE 30SCT	6	1012.3	82.5	76.0	73.5	74	.4	.4	090 04 08	86.0	17.5	069	220	10.0
13.40	172.08	HAZE 30SCT	6	1012.4	82.5	76.8	74.6	77	.5	.5	090 04 08	86.0	22.5	070	220	10.0
13.32	172.16	HAZE 30SCT	7	1012.4	83.0	77.5	75.5	78	.4	.4	070 06 08	86.0	23.0	070	220	10.0
13.24	172.24	HAZE 30SCT	7	1012.3	83.2	76.8	74.4	75	.5	.5	070 06 08	86.0	20.0	073	220	10.0
13.19	172.31	HAZE 30SCT	7	1011.4	82.3	75.8	73.3	74	.4	.3	070 06 08	86.0	19.0	095	312	10.0
13.27	172.36	HAZE 30SCT	7	1010.9	82.8	75.9	73.2	74	.4	.4	070 06 08	86.0	17.5	090	312	10.0
13.36	172.44	HAZE 30SCT	7	1010.1	82.2	76.0	73.6	75	.4	.4	070 06 08	86.0	18.5	089	312	10.0
13.47	172.53	HAZE 30SCT	7	1009.7	81.8	76.8	74.9	76	.6	.6	070 06 08	86.0	16.0	095	312	10.0
13.51	173.00	HAZE 30SCT	7	1010.0	82.0	75.7	73.2	75	.5	.5	070 06 08	86.0	18.0	089	312	10.0
14.00	172.58	HAZE 30SCT	7	1009.9	82.0	75.5	73.0	74	.3	.3	090 08 05	86.0	15.0	070	047	10.0
14.07	172.50	HAZE E30BKN	7	1010.6	81.7	76.0	73.8	77	.6	.6	090 08 05	86.0	17.0	053	047	10.0
14.18	172.45	HAZE 30SCT	8	1011.0	81.8	74.8	72.0	72	.3	.3	090 08 05	86.0	17.5	062	047	10.0
14.20	172.38	30 SCT	8	1011.1	81.8	73.9	70.6	69	.3	.3	090 08 05	86.0	17.5	064	047	10.0
14.24	172.34	30 SCT	8	1011.3	82.2	76.0	73.6	75	.3	.3	090 08 05	86.0	17.0	068	047	10.0
14.29	172.29	30 SCT	8	1011.7	81.9	76.2	74.0	77	.3	.3	090 08 05	86.0	17.0	070	047	10.0
14.32	172.25	30 SCT	8	1011.8	81.2	75.8	73.7	78	.3	.3	090 08 05	86.0	17.0	073	047	10.0

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14.38	172.19	30 SCT	8	1011.9	81.2	75.8	73.7	79	.3	.3	090 08 05	86.0	17.5	075	047	10.0
14.42	172.14	30 SCT	8	1012.0	81.3	75.5	73.2	76	.3	.3	080 05 05	86.0	18.5	077	047	10.0
14.47	172.09	30 SCT	8	1012.0	81.4	76.0	73.9	78	.3	.3	090 05 05	86.0	18.0	075	047	10.0
14.52	172.04	30 SCT	8	1012.0	81.3	75.9	73.8	78	.3	.3	090 06 08	86.0	17.5	079	047	10.0
15.00	172.01	30 SCT U BKN	8	1012.3	82.2	76.0	73.7	75	.6	.6	090 06 08	86.0	16.0	080	047	10.0
15.05	171.56	30SCTU-BKN	8	1012.5	82.5	76.0	73.5	74	.6	.2	090 06 08	86.0	17.0	076	047	10.0
15.10	171.55	30SCTU-BKN	8	1012.7	82.5	76.8	74.6	77	1.0	.3	090 06 08	86.0	17.0	075	047	10.0
15.12	172.52	E 30 BKN 130 BKN U OVC	8	1012.9	81.2	75.8	73.7	79	1.0	.7	090 06 10	86.0	17.5	078	ALL	STOP
15.16	171.44	30SCTU-OVC	8	1013.0	81.8	73.9	70.6	69	1.0	.2	090 06 10	86.0	20.0	059	052	10.0
15.21	171.37	30SCT U-OVC	8	1013.1	82.9	74.7	71.4	68	1.0	.1	090 08 10	86.0	20.0	072	052	10.0
15.26	171.35	30SCT U-OVC	8	1013.5	82.9	75.8	73.0	72	1.0	.6	090 10 06	86.0	17.0	058	052	10.0
15.31	171.28	30SCT U-OVC	8	1013.2	83.5	76.8	74.3	73	1.0	.5	090 10 06	86.0	20.0	064	052	10.0
15.39	171.23	30 SCT U OVC	8	1012.4	83.2	76.8	74.4	75	1.0	.6	090 10 06	86.0	17.0	071	052	10.0
15.41	171.19	RWU E 30 BKN U BKN	8	1012.0	82.1	76.9	75.0	79	1.0	.8	090 10 10	86.0	19.0	064	052	10.0
15.47	171.10	E30BKN UOVC	8	1011.7	81.8	76.0	73.7	77	1.0	.8	090 10 10	86.0	16.5	072	052	10.0
15.52	171.05	E30BKN8OBKN	8	1011.5	82.2	75.5	72.9	73	1.0	1.0	090 10 10	86.0	17.0	078	052	10.0
15.57	170.58	30 SCT E 100 BKN U OVC	8	1011.5	81.8	76.8	74.9	80	1.0	1.0	090 10 10	86.0	18.0	068	052	10.0
16.03	170.51	E 30 BKN 100 BKN U OVC	8	1012.2	81.4	76.4	74.5	80	1.0	1.0	090 10 10	86.0	17.0	078	052	10.0
16.09	170.43	30 SCT E100 BKN U OVC	8	1012.5	81.7	75.4	71.8	72	1.0	.9	100 08 08	86.0	19.5	064	052	10.0
16.12	170.36	30 SCT / SCT	8	1013.1	81.5	75.8	73.6	77	.5	.4	100 08 08	86.0	19.0	072	052	10.0
16.20	170.43	30 SCT / SCT	8	1013.2	81.2	75.8	73.7	79	.5	.4	100 08 08	86.0	19.5	071	052	10.0
16.26	170.50	30 SCT / SCT	8	1013.4	81.4	76.4	74.5	80	.5	.4	100 08 08	86.0	19.5	073	052	10.0
16.32	170.55	30 SCT / SCT	8	1013.6	81.3	75.9	73.8	78	.5	.4	100 08 08	86.0	20.0	070	052	10.0
16.38	171.05	30 SCT / SCT	8	1013.8	81.2	75.8	73.7	79	.5	.4	100 08 08	86.0	19.5	070	052	10.0

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16.43	171.13	30SCT U-OVC	8	1013.9	81.5	75.8	73.6	77	1.0	.5	090 06 10	86.0	15.0	070	225	10.0
16.46	171.15	30SCT U-OVC	8	1014.1	81.2	76.8	75.1	82	1.0	.5	090 06 10	86.0	15.0	070	225	10.0
16.41	171.27	30SCT U-OVC	8	1013.8	81.8	76.8	74.9	79	1.0	.5	090 06 10	86.0	18.0	070	225	10.0
16.31	171.36	30SCT U-OVC	8	1013.7	81.8	74.8	72.0	72	1.0	.5	090 06 10	86.0	17.0	068	225	10.0
16.22	171.43	30SCT U-OVC	8	1013.4	81.7	76.0	73.8	77	1.0	.5	090 06 10	86,0	16.0	066	225	10.0
16.20	171.53	30SCT U-OVC	8	1013.2	81.4	76.0	73.9	78	1.0	.5	090 06 10	86.0	18.5	065	225	10.0
16.08	172.01	30 SCT E 100 BKN U OVC	8	1013.0	81.3	76.5	74.7	81	1.0	1.0	090 06 10	86.0	19.0	062	225	10.0
15.50	172.25	30 SCT E 100 BKN U OVC	8	1012.9	81.5	76.8	75.0	81	1.0	1.0	090 06 10	86.0	16.5	063	ALL	STOP
15.40	172.30	30 SCT E 100 OVC	8	1013.6	82.0	76.5	74.4	79	1.0	1.0	090 06 10	86.0	20.0	061	223	10.0
15.31	172.41	30 SCT E 100 OVC	8	1013.8	83.0	77.5	75.5	78	1.0	1.0	090 06 10	86.0	21.5	059	223	10.0
15.21	172.50	RWU E 30 BKN 100 OVC	7	1013.7	82.5	77.0	74.9	78	1.0	1.0	090 06 10	86.0	23.5	067	223	10.0
15.13	173.00	30SCT E100BKN	8	1013.4	82.0	77.5	75.9	82	.8	.8	090 06 10	86.0	21.0	061	223	10.0
15.10	173.05	30SCTE100BKN	8	1012.5	82.5	76.7	74.5	77	.8	.8	090 06 10	86.0	23.5	064	223	10.0
14.59	173.17	30SCTE100BKN	8	1011.8	81.8	76.8	74.9	79	.7	.7	090 06 10	86.0	25.0	075	223	10.0
14.56	173.21	E30BKN1000VC	8	1011.3	81.2	76.8	75.2	82	1.0	1.0	090 06 10	86.0	22.0	070	223	10.0
14.46	173.34	RWU E 30 BKN 100BKN UOVC	8	1011.1	81.5	77.4	75.9	83	1.0	.9	090 06 10	86.0	20.0	072	223	10.0
14.32	173.44	RW- E30 BKN 100BKN UOVC	7	1011.0	82.8	78.0	76.3	81	1.0	1.0	090 05 10	86.0	15.0	088	223	10.0
14.36	173.50	RW E 30 BKN 100 OVC	3	1011.6	80.0	77.0	75.9	87	1.0	1.0	090 06 08	86.0	13.0	095	315	10;0
14.42	173.57	RW E 30 BKN 100BKN UOVC	4	1011.9	79.8	77.2	76.2	89	1.0	1.0	090 06 08	86.0	19.5	098	315	10.0
14.56	174.04	RWU E 30 BKN 100 OVC	4	1012.3	81.3	76.8	75.1	81	1.0	1.0	090 06 08	86.0	19.0	103	315	10.0
15.00	174.14	RWU E 30 BKN 100 OVC	4	1012.4	81.3	76.5	74.7	81	1.0	1.0	090 06 08	86.0	19.0	112	315	10.0
15.10	174.10	RWU E 30 BKN 100 OVC	4	1012.5	81.5	76.8	75.0	81	1.0	1.0	090 06 08	86.0	20.0	116	048	10.0
15.23	174.05	E 30 BKN 100 OVC	4	1012.7	81.4	76.0	73.9	78	1.0	1.0	090 06 08	86.0	18.5	118	048	10.0
15.21	173.58	E 30 BKN 100 OVC	4	1012.8	81.2	76.8	75.1	82	1.0	1.0	090 06 08	86.0	20.0	120	048	10.0

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15.26	173.54	RWU 30 SCT E 100 BKN	6	1012.8	81.5	76.2	74.2	78	.8	.8	090 06 08	86.0	17.0	115	048	10.0
15.32	173.47	RWU 30 SCT E 100 BKN	6	1012.9	81.5	76.5	74.6	80	.8	.8	090 06 08	86.0	16.0	118	048	10.0
15.37	173.42	RWU 30 SCT E 100 BKN	6	1013.0	81.8	75.8	73.4	76	.8	.8	090 06 08	86.0	16.5	115	048	10.0
15.43	173.35	RWU 30 SCT E 100 BKN	6	1013.2	81.9	76.2	74.0	77	.8	.8	090 06 08	86.0	18.0	112	048	10.0
15.48	173.30	RWU 30 SCT E 100 BKN	6	1013.4	81.2	76.8	74.8	81	.8	.8	090 06 08	86.0	19.0	107	048	10.0
15.59	173.24	RAIN 30 SCT E 90 OVC	6	1013.6	81.2	74.8	72.2	74	1.0	1.0	090 06 08	86.0	17.0	100	048	10.0
16.00	173.19	RAIN 30 SCT E 90 OVC	6	1013.8	81.5	76.2	74.2	78	1.0	1.0	090 06 08	86.0	15.0	097	048	10.0
16.11	173.09	RAIN 30 SCT E 80 OVC	6	1013.9	81.2	76.8	74.8	81	1.0	1.0	100 06 08	86.0	17.0	090	048	10.0
16.20	173.00	RAIN 30 SCT E 80 OVC	6	1014.4	81.0	77.0	75.5	83	1.0	1.0	100 06 08	86.0	17.5	095	048	10.0
16.29	172.50	RW- E 30 BKN 80 OVC	7	1014.9	82.0	76.5	74.4	78	1.0	1.0	100 06 08	86.0	16.5	100	048	10.0
16.36	172.41	RWU E 30 BKN 80 OVC	8	1015.0	82.2	76.9	75.3	80	1.0	1.0	100 06 08	86.0	18.5	086	048	10.0
16.42	172.36	RWU E 30 BKN 80 OVC	8	1015.2	81.2	76.8	74.8	81	1.0	1.0	100 06 08	86.0	20.5	102	048	10.0
16.50	172.26	30SCTE1000VC	8	1013.9	81.9	76.2	74.0	77	1.0	1.0	090 05 09	86.0	17.0	079	091	10.0
16.56	172.16	30SCTE1000VC	8	1013.9	81.8	75.8	73.4	76	1.0	1.0	090 05 09	86.0	20.0	073	091	10.0
16.54	172.08	E30BKN1000VC	8	1013.5	82.5	76.5	74.2	76	1.0	1.0	090 05 09	86.0	17.0	076	091	10.0
16.55	171.54	E30BKN1000VC	8	1013.7	81.5	76.2	74.2	78	1.0	1.0	090 05 09	86.0	15.5	090	091	10.0
16.53	171.48	E30BKN1000VC	8	1013.8	81.1	75.3	73.0	76	1.0	1.0	090 05 08	86.0	20.0	090	091	10.0
16.52	171.40	RWU E30BKN1000VC	8	1013.7	81.2	75.8	73.7	78	1.0	1.0	090 05 08	86.0	18.5	068	091	10.0
16.52	171.33	30SCTE1000VC	8	1014.3	81.2	74.8	72.2	74	1.0	1.0	090 05 08	86.0	15.0	067	091	10.0
16.52	171.28	30SCTE1000VC	8	1014.7	81.0	75.5	73.3	77	1.0	1.0	090 06 08	86.0	18.0	061	091	10.0
16.53	171.19	30SCTE1000VC	8	1014.6	81.1	75.5	73.3	77	1.0	1.0	090 06 08	86.0	18.0	062	091	10.0
16.53	171.10	30SCTE1000VC	8	1014.5	80.8	75.2	73.0	77	1.0	1.0	090 06 08	86.0	18.5	067	091	10.0
16.53	171.03	30SCTE100BKN	8	1014.4	81.5	74.8	72.1	73	.9	.9	090 06 08	86.0	18.5	067	091	10.0
16.53	170.52	30SCTE100BKN	8	1014.3	81.2	75.8	73.7	78	.8	.8	090 06 08	86.0	18.0	065	091	10.0

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16.53	170.44	30SCT100SCT	8	1014:1	81:0	75:5	73:3	77	:5	:5	090 06 08	86.0	18.0	064	091	10.0
16.53	170.40	30SCTE100BKN	8	1014.3	81.1	75.3	73.0	76	.7	.7	090 06 08	86.0	18.0	062	091	10.0
16.50	170.27	30SCT 100SCT	8	1014.2	81.8	75.8	73.4	76	.5	.5	090 06 08	86.0	19.0	060	091	10.0
16.50	170.19	30SCTE100BKN	8	1014.2	81.5	76.2	74.2	78	.6	.6	090 06 08	86.0	18.5	058	091	10.0
16.50	170.12	30SCTE100BKN	8	1014.3	81.5	76.5	74.6	80	.8	.8	090 06 08	86.0	19.0	056	091	10.0
16.50	170.07	30SCTE100PVC	8	1014.4	81.2	76.8	74.8	81	1.0	1.0	090 06 08	86.0	19.5	054	091	10.0
16.50	170.00	30SCTE1000VC	8	1014.3	81.0	77.0	75.5	83	1.0	1.0	090 06 08	86.0	20.0	052	091	10.0
16.49	170.00	30SCTE1000VC	8	1014.2	80.8	75.2	73.0	77	1.0	1.0	090 06 08	86.0	20.0	050	ALL	STOP
16.48	169.54	30SCTE1000VC	8	1015.6	81.1	75.5	73.3	77	1.0	1.0	090 06 08	86.0	19.0	066	085	10.0
16.45	169.49	30 SCT 100 SCT U OVC	8	1016.1	81.5	74.8	72.1	73	1.0	1.0	060 06 08	86.0	16.0	063	085	10.0
16.42	169.45	30 SCT E 100 BKN U OVC	8	1016.2	82.4	75.3	72.5	72	1.0	1.0	060 06 08	86.0	22.0	068	085	10.0
16.47	169.35	30 SCT E 100 BKN U OVC	8	1015.8	81.9	74.9	72.5	73	1.0	1.0	060 06 08	86.0	18.0	067	067	10.0
16.50	169.28	30 SCT E 100 BKN U OVC	8	1014.4	81.8	74.8	72.0	72	1.0	1.0	060 06 08	86.0	16.5	050	067	10.0
16.53	169.23	30SCTE100BKN	8	1013.8	81.5	74.8	72.1	73	1.0	1.0	060 06 08	86.0	15.5	060	067	10.0
16.55	169.20	E30BKN1000VC	8	1013.5	81.2	75.8	73.7	78	1.0	1.0	060 06 08	86.0	13.0	060	067	10.0
16.57	169.10	E30BKN1000VC	8	1013.3	81.6	76.2	74.1	78	1.0	1.0	060 06 08	86.0	14.5	060	067	10.0
17.02	169.03	E30BKN1000VC	8	1013.0	81.0	76.0	74.1	79	1.0	1.0	060 06 08	86.0	19.5	060	067	10.0
17.05	168.54	E30BKN1000VC	8	1013.1	81.0	76.2	74.4	80	1.0	1.0	060 06 08	86.0	14.5	060	067	10.0
17.09	168.44	30 SCT E 100 BKN U OVC	8	1013.9	81.0	76.7	75.1	82	1.0	1.0	060 06 08	86.0	20.0	06	067	10.0
17.13	168.37	E30BKN1000VC	8	1014.4	81.0	76.4	74.7	81	1.0	1.0	060 06 08	86.0	22.0	046	067	10.0
17.17	168.27	30SCTE1000VC	8	1014.5	81.0	76.0	74.1	78	1.0	1.0	060 06 08	86.0	20.0	060	067	10.0
17.20	168.17	30SCTE1000VC	8	1014.7	81.0	77.0	75.5	83	.8	.8	060 06 08	86.0	18.0	060	067	10.0
17.23	168.11	30SCT 100SCT	8	1014.8	81.1	75.5	73.3	77	.5	.5	060 06 08	86.0	17.0	060	067	10.0
17.27	167.00	30 SCT	8	1014.8	81.1	75.3	73.0	76	.4	.4	060 06 08	86.0	15.0	060	067	10.0

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17.31	167.50	30 SCT	8	1015.0	80.8	75.2	73.0	77	.4	.4	060 05 08	86.0	16.0	075	327	5.0
17.35	167.41	30 SCT	8	1015.0	79.9	74.6	72.5	78	.3	.3	060 04 08	86.0	15.5	086	327	5.0
17.39	167.54	30 SCT	8	1015.1	79.8	77.2	76.2	89	.3	.3	060 04 08	86.0	16.0	076	327	5.0
17.41	167.57	30 SCT	8	1014.9	80.0	77.0	75.9	87	.3	.3	060 04 08	86.0	16.5	075	327	5.0
17.45	168.02	30 SCT	8	1014.7	81.0	77.0	75.5	83	.3	.3	060 04 08	86.0	17.5	070	070	10.0
17.49	167.57	30 SCT 100SCT	8	1014.5	80.8	75.2	73.0	77	.4	.4	060 04 08	86.0	17.0	065	070	10.0
17.51	167.52 49	30SCTE100BKN	8	1014.3	81.0	75.5	73.3	77	.6	.6	060 05 09	86.0	16.5	060	070	10.0
17.57	167.39	30SCTE120BKN	8	1014.6	80.7	74.6	72.2	75	.8	.8	060 06 10	86.0	17.0	055	070	10.0
18.01	167.29	30SCTE100BKN	8	1015.3	82.8	74.8	72.4	71	.6	.6	060 06 10	86.0	20.0	060	070	10.0
18.04	167.20	E30BKN100BKN	8	1015.4	81.8	75.9	73.6	76	.8	.8	060 06 10	86.0	15.0	047	070	10.0
18.06	167.10	30 SCT E 100 BKN U BKN	8	1015.5	82.1	74.8	72.3	72	.9	.8	060 06 10	86.0	15.0	070	070	10.0
18.11	167.01	30 SCT U-BKN	8	1015.3	81.4	74.8	72.1	73	.8	.4	060 06 10	86.0	15.0	070	070	10.0
18.13	166.52	30 SCT U BKN	8	1014.4	81.6	74.8	72.1	73	.6	.5	060 06 10	86.0	15.0	070	070	10.0
18.17	166.45	30 SCT / SCT	8	1014.1	81.5	74.2	71.6	72	.3	.3	060 06 10	86.0	15.0	070	070	10.0
18.19	166.36	30 SCT / SCT	8	1013.4	81.8	74.8	72.4	73	.4	.4	060 06 10	86.0	13.0	070	070	10.0
18.20	166.28 31	30 SCT / SCT	8	1012.9	81.6	73.7	70.4	69	.2	.2	060 05 10	86.0	11.0	061	070	10.0
18.23	166.20 24	30 SCT / SCT	8	1012.9	80.8	73.0	69.7	69	,3	.3	060 05 10	86.0	11.0	063	070	10.0
18.26	166.12	30 SCT E 100 BKN U BKN	8	1013.3	80.9	74.8	72.4	75	.7	.7	060 05 10	86.0	11.0	070	071	10.0
18.34	166.11	30 SCT E 100 BKN U BKN	8	1014.1	80.7	72.7	69.3	67	.9	.7	060 03 10	86.0	11.0	070	071	10.0
18.38	166.02	30 SCT 100 SCT U BKN	8	1014.8	80.7	74.8	72.4	76	.6	.5	060 03 10	86.0	11.0	070	071	10.0
18.42	165.51	30SCT 100SCT	8	1014.9	79.9	74.6	72.5	78	.5	.5	060 03 10	86.0	12.0	068	071	10.0
18.45	165.43	30 SCT	8	1014.8	80.0	77.0	75.9	87	.3	.3	060 03 10	86.0	13.0	068	071	10.0
18.48	165.32	30 SCT	8	1014.7	79.2	72.8	70.1	74	.4	.4	060 03 10	86.0	14.0	065	071	10.0
18.51	165.24	30 SCT	8	1014.5	79.8	77.2	76.2	89	.3	.3	060 03 10	86.0	15.5	063	071	10.0

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GMT	LAMO	OBSCN/WX	WTS	SLP	DRY B	WET B	DEW PT	HUMID	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND	VIS	CEIL
18.55	165.12	30 SCT	8	1014.7	79.9	74.6	72.5	78	.3	.3	060 03 10	86.0	16.0	065	071	10.0
18.54	165.19	30 SCT	8	1014.6	79.2	72.8	70.1	74	.2	.2	060 03 10	86.0	16.0	063	071	10.0
19.00	164.55	30 SCT	8	1014.8	79.0	72.0	68.9	71	.3	.3	060 03 10	86.0	15.5	061	071	10.0
19.04	164.45	30 SCT	8	1014.9	79.5	72.0	68.7	69	.3	.3	060 04 10	86.0	15.5	058	071	10.0
19.06	164.39	30 SCT	8	1015.0	79.6	72.4	69.3	70	.3	.3	060 03 10	86.0	15.0	055	071	10.0
19.05	164.32	30SCT100BKN	8	1015.2	79.5	72.5	69.5	72	.4	.4	060 03 10	86.0	14.5	050	071	10.0
19.08	164.24	30SCTE100BKN	8	1015.3	79.5	73.0	70.2	73	.6	.6	060 03 10	86.0	14.0	048	071	10.0
19.09	164.17	30 SCT E 100 BKN U OVC	8	1015.4	79.5	73.7	71.3	76	1.0	.6	060 04 08	86.0	14.0	039	071	10.0
19.12	164.08	30 SCT 100 SCT U- OVC	8	1016.0	81.0	74.0	71.1	72	1.0	.5	060 04 08	86.0	15.0	040	071	10.0
19.15	164.00	30SCTE100BKN	8	1016.2	83.1	73.8	69.9	64	.6	.6	060 04 08	86.0	14.0	045	071	10.0
19.18	163.50	RWU 30 SCT E 100 BKN	8	1016.4	82.0	73.8	70.4	68	.6	.6	060 04 10	86.0	14.0	045	071	10.0
19.20	163.33	RWU E 30 BKN 100 OVC	8	1015.9	79.5	75.5	73.9	83	1.0	1.0	060 04 10	86.0	14.0	038	071	10.0
19.23	163.23	RWU E 30 BKN 100 OVC	7	1015.0	78.3	74.2	72.5	82	1.0	1.0	060 04 10	86.0	15.0	080	071	10.0
19.26	163.13	RW- E 30 OVC	8	1014.3	77.2	73.4	71.8	83	1.0	1.0	060 04 10	86.0	15.0	039	071	10.0
19.30	163.02	RW- E 30 OVC	6	1013.7	75.4	73.8	73.3	93	1.0	1.0	060 04 10	86.0	12.0	045	071	10.0
19.31	162.51	RW E 30 OVC	4	1013.1	77.3	74.2	72.9	86	1.0	1.0	060 04 10	86.0	12.0	045	071	10.0
19.37	162.41	RW E 30 OVC	4	1013.2	79.8	74.4	72.2	78	.9	.9	060 05 10	86.0	9.0	040	071	10.0
19.41	162.30	30SCTE100BKN	8	1013.1	78.5	74.0	72.1	80	.6	.6	060 05 10	86.0	14.5	063	071	10.0
19.42	162.35	E30BKN100BKN	8	1013.6	79.2	75.5	74.1	85	.7	.7	060 05 10	86.0	16.0	087	071	10.0
19.43	162.31	30SCT 100SCT	8	1013.9	79.8	73.9	71.5	76	.4	.4	060 04 10	86.0	14.5	063	075	10.0
19.46	162.22	30 SCT	8	1014.1	79.9	73.5	70.8	74	.3	.3	060 04 10	86.0	14.0	060	075	10.0
19.48	162.13	30 SCT	8	1014.4	79.9	74.6	72.5	78	.4	.4	060 04 10	86.0	14.0	067	075	10.0
19.50	162.05	30 SCT	8	1014.7	79.5	75.5	73.9	83	.3	.3	060 04 10	86.0	15.0	065	075	10.0
19.52	161.55	30 SCT	8	1014.9	80.0	77.0	75.9	87	.3	.3	060 04 10	86.0	15.0	066	075	10.0

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EST	GMT	TOTAL SKY	VIS	SLP	DRY B	WET B	DEW PT	HUMD	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND	AIR	WORK
18:55	165.12	30 SCT	8	1014.7	79.9	74.6	72.5	78	.3	.3	060 03 10	86.0	16.0	065	071	10.0
18.54 7	165.19	30 SCT	8	1014.6	79.2	72.8	70.1	74	.2	.2	060 03 10	86.0	16.0	063	071	10.0
19.00	164.55	30 SCT	8	1014.8	79.0	72.0	68.9	71	.3	.3	060 03 10	86.0	15.5	061	071	10.0
19.04	164.45	30 SCT	8	1014.9	79.5	72.0	68.7	69	.3	.3	060 04 10	86.0	15.5	058	071	10.0
19.06	164.39	30 SCT	8	1015.0	79.6	72.4	69.3	70	.3	.3	060 03 10	86.0	15.0	055	071	10.0
19.05 02	164.32 33	30SCT100BKN	8	1015.2	79.5	72.5	69.5	72	.4	.4	060 03 10	86.0	14.5	050	071	10.0
19.08 04	164.24 23	30SCTE100BKN	8	1015.3	79.5	73.0	70.2	73	.6	.6	060 03 10	86.0	14.0	048	071	10.0
19.09 07	164.17	30 SCT E 100 BKN U OVC	8	1015.4	79.5	73.7	71.3	76	1.0	.6	060 04 08	86.0	14.0	039	071	10.0
19.12 10	164.08 13	30 SCT 100 SCT U- OVC	8	1016.0	81.0	74.0	71.1	72	1.0	.5	060 04 08	86.0	15.0	040	071	10.0
19.15	164.00	30SCTE100BKN	8	1016.2	83.1	73.8	69.9	64	.6	.6	060 04 08	86.0	14.0	045	071	10.0
19.18 16	163.50 43	RWU 30 SCT E 100 BKN	8	1016.4	82.0	73.8	70.4	68	.6	.6	060 04 10	86.0	14.0	045	071	10.0
19.20 19	163.33	RWU E 30 BKN 100 OVC	8	1015.9	79.5	75.5	73.9	83	1.0	1.0	060 04 10	86.0	14.0	038	071	10.0
19.23 22	163.23	RWU E 30 BKN 100 OVC	7	1015.0	78.3	74.2	72.5	82	1.0	1.0	060 04 10	86.0	15.0	080	071	10.0
19.26 25	163.13	RW- E 30 OVC	8	1014.3	77.2	73.4	71.8	83	1.0	1.0	060 04 10	86.0	15.0	039	071	10.0
19.30 29	163.02	RW- E 30 OVC	6	1013.7	75.4	73.8	73.3	93	1.0	1.0	060 04 10	86.0	12.0	045	071	10.0
19.31	162.51	RW E 30 OVC	4	1013.1	77.3	74.2	72.9	86	1.0	1.0	060 04 10	86.0	12.0	045	071	10.0
19.37 34	162.41	RW E 30 OVC	4	1013.2	79.8	74.4	72.2	78	.9	.9	060 05 10	86.0	9.0	040	071	10.0
19.41 38	162.30	30SCTE100BKN	8	1013.1	78.5	74.0	72.1	80	.6	.6	060 05 10	86.0	14.5	063	071	10.0
19.42	162.35 9	E30BKN100BKN	8	1013.6	79.2	75.5	74.1	85	.7	.7	060 05 10	86.0	16.0	087	071	10.0
19.43	162.31	30SCT 100SCT	8	1013.9	79.8	73.9	71.5	76	.4	.4	060 04 10	86.0	14.5	063	075	10.0
19.46	162.22	30 SCT	8	1014.1	79.9	73.5	70.8	74	.3	.3	060 04 10	86.0	14.0	060	075	10.0
19.48	162.13	30 SCT	8	1014.4	79.9	74.6	72.5	78	.4	.4	060 04 10	86.0	14.0	067	075	10.0
19.50	162.05	30 SCT	8	1014.7	79.5	75.5	73.9	83	.3	.3	060 04 10	86.0	15.0	065	075	10.0
19.52	161.55	30 SCT	8	1014.9	80.0	77.0	75.9	87	.3	.3	060 04 10	86.0	15.0	066	075	10.0